677
TR-2

TEXTILE MANUFACTURER

MATERIALS • PROCESSES • PRODUCTION • MANAGEMENT

Monthly: Two Shillings and Sixpence ESTABLISHED 1875 MARCH 1958

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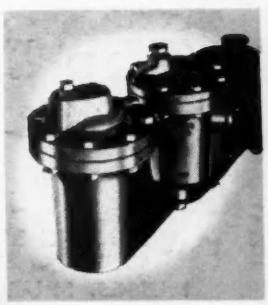
MAR 31 1958

The largest DYE VAT UNIT in the World

Drayton-Armstrong steam traps installed on a Longclose large hank dyeing machine now in operation at the Birstall Carpet Co. Ltd. for dyeing 9,000 lbs. of yarn at a time. 12,500 gallons of liquor are withdrawn, mixed and interchanged between four tanks; temperature control is a critical feature. Any difference in the rate of temperature rise between the tanks would cause lack of uniformity of shade. The machine is fully automatic: the temperature of the four vats is controlled by a Drayton D.V. 3 Dye Vat Control.



Drayton-Armstrong Traps are supplied in vertical, horizontal and angle types.

For the highest efficiency day in day out, you must have the BEST steam trapping practice. That is why you will find more Drayton-Armstrongs in use throughout British industry than any other make of trap. They have the longest trouble-free life and the highest discharge capacity of any trap there is. To the firm with several hundred traps installed this may mean a saving of hundreds of pounds on maintenance alone and more still by ensuring no loss of production. The Drayton book on trapping explains all this and is well worth writing for.

★ **is fitted with**

DRAYTON Steam Traps

Write to Dept. T.M. **THE DRAYTON REGULATOR & INSTRUMENT CO. LTD., WEST DRAYTON, MIDDLESEX.** Tel.: West Drayton 4012

Photographs by courtesy of SPUR DOUBLING CO. LTD., Reddish, nr. Stockport

The Westmorland
DOUBLER

PRODUCES FOR **JOHN CROSSLEY & SONS LTD.**

THROUGH THEIR ASSOCIATED COMPANY

MESSRS. SPUR DOUBLING CO. LTD.

Carpet Yarns
ON CONE OR CHEESE

The Westmorland Doubler is particularly suitable for processing Tufted Carpet Yarns being fed by multiple end wound packages normally 8″ × 8″ on 1½″ bore tubes, but a 10″ traverse × 8″ diameter package can be applied if desired.

This means a completely knotless package can be doffed in cone or cheese form, ready for the tufting machine. Maximum cone diameter 10″. Two turns for every revolution of the spindle are inserted, giving extremely high production, viz.: 3 fold 3s counts, inserting 3 T.P.I.

Approximate production per 44 hours from 36 spindle machine—6,000 lbs.

The Westmorland Doubler is manufactured under agreement by

S. DODD & SONS LTD.

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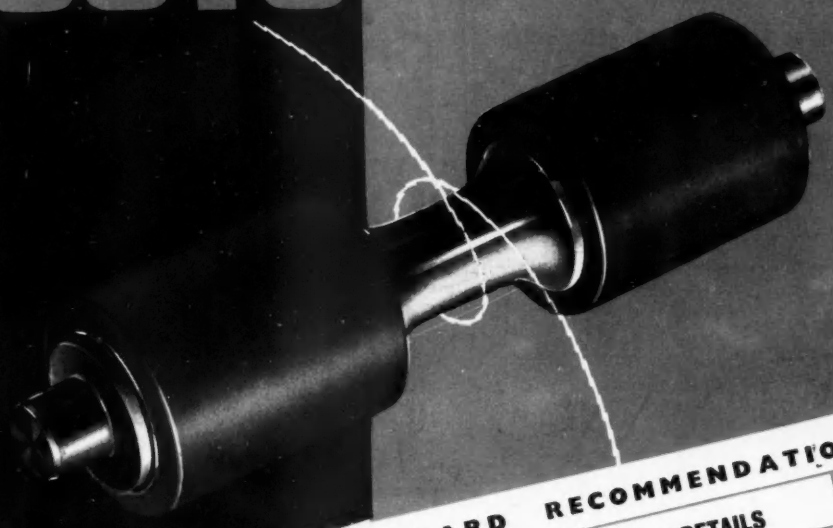
DODD

TEXTILE MACHINERY

GACOTS

TEXTILE ROLLER COVERINGS



STANDARD RECOMMENDATIONS		
APPLICATION	YARN DETAILS	GRADE
Comber Detaching ...	—	CA 74
Comber Drawbox ...	—	CA 78
Drawframe	Cotton	CA 78
Drawframe	Fibro	CR 85
Sliver Lap	—	CA 78
Ribbon Lap	—	CA 78
Slubbing	—	CR 85
Intermediate	—	CR 85
Roving	—	CR 85
Jack	—	CR 85
High Draft Speed Frames	—	CR 85
Ring	Counts up to 70's	CR 75
Ring	Counts over 50's	CR 65
No Traverse Ring ...	—	CS 72
Balmes Ring	—	CR 75
Fine Spinning Mules ...	—	CR 75
Oldham Mules	—	CY 81

Cut Spinning Costs

TECHNICAL SERVICE

Our staff of technical representatives are ready to visit your mill and make individual recommendations and provide follow-up assistance and advice.

ROLLER COVERING SERVICE

Gacots can be supplied to users in the United Kingdom, mounted and ground ready for immediate use, by our official agents and roller coverers :—

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WERNETH LEATHER WORKS
OLDHAM, Lancs.
TELEPHONE - MAIN 4085

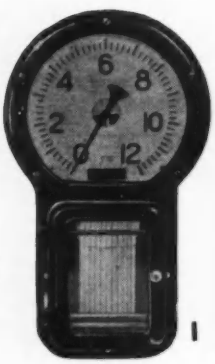
GEORGE ANGUS & Co LTD

OIL SEAL DIVISION, COAST ROAD, WALLSEND-ON-TYNE

For a complete picture of Boiler House conditions

Designed for use in the smallest as well as the largest of industrial plants, the Kelvin Hughes range of boiler house instruments requires the minimum of maintenance. Visual indication helps to ensure the economic use of fuel and optimum, ' smogless ' combustion conditions.

Our technical advisory facilities are at your service.



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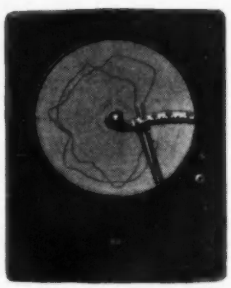

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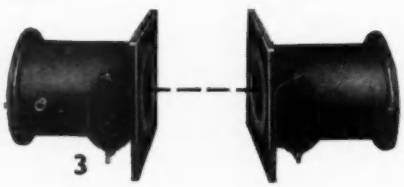

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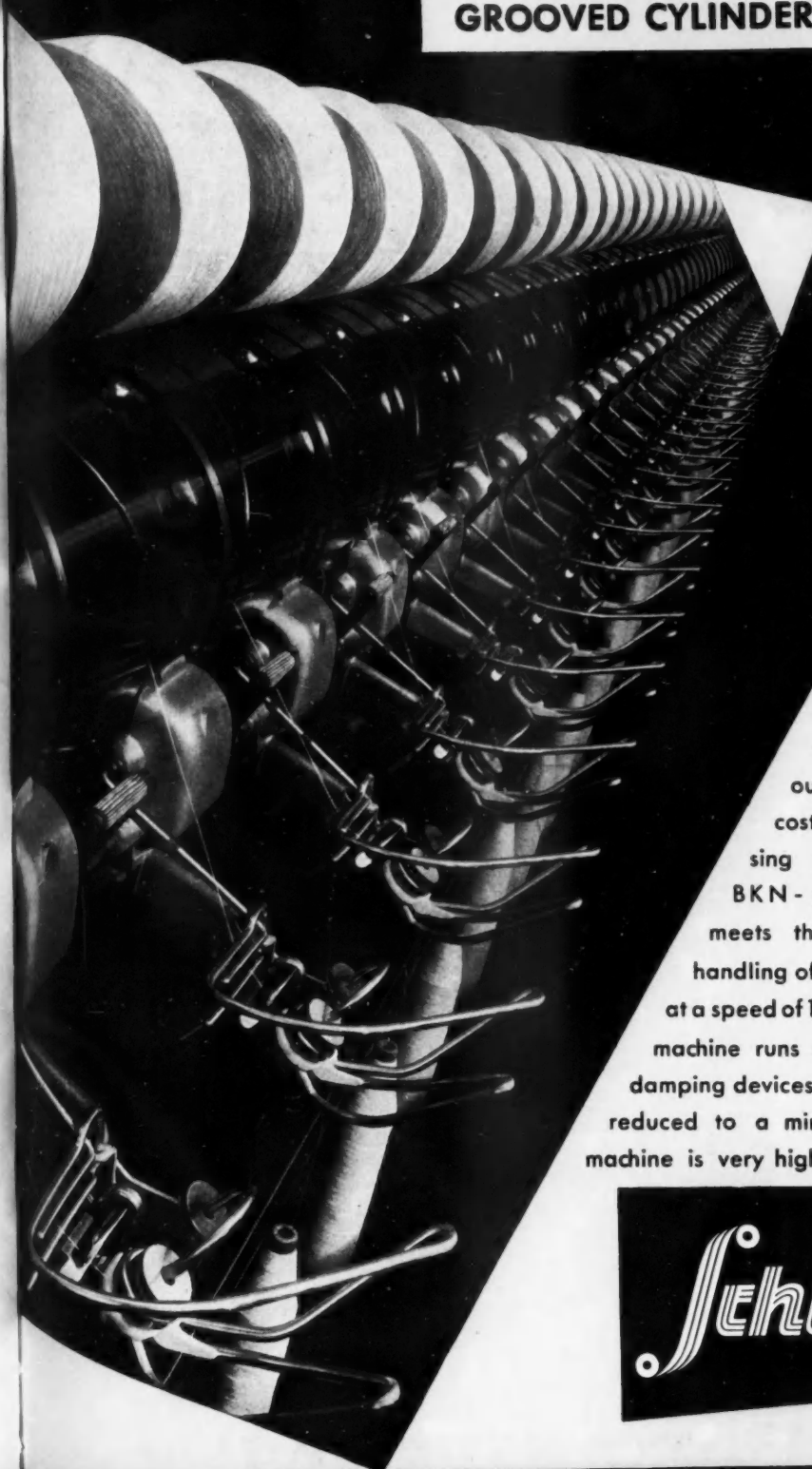
GROOVED CYLINDER CONE WINDER



B-K-N

It is the aim of the modern textile mill to attain highest output at reduced costs, thereby increasing productiveness. The BKN-pattern winder fully meets these demands. Gentle handling of the yarn is ensured even at a speed of 1300 yards/min, at which the machine runs smoothly due to hydraulic damping devices. The operative times being reduced to a minimum, the efficiency of the machine is very high and the cost of winding low.

Schlafhorst

UNIONMATEX

W. SCHLAFHORST & CO. M.-GLADBACH GERMANY

KLEINEWEFERS

PRINTING MACHINE

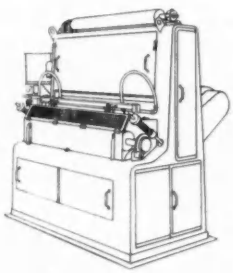
Autoprint

A modern printing machine must not only answer to great technical requirements such as smooth running and precisely correct ratio of pattern but it must also have other essential features such as high speed, simple operation by mechanical controls and faultless regulation of the complete printing plant including dryer and endless blanket washer.

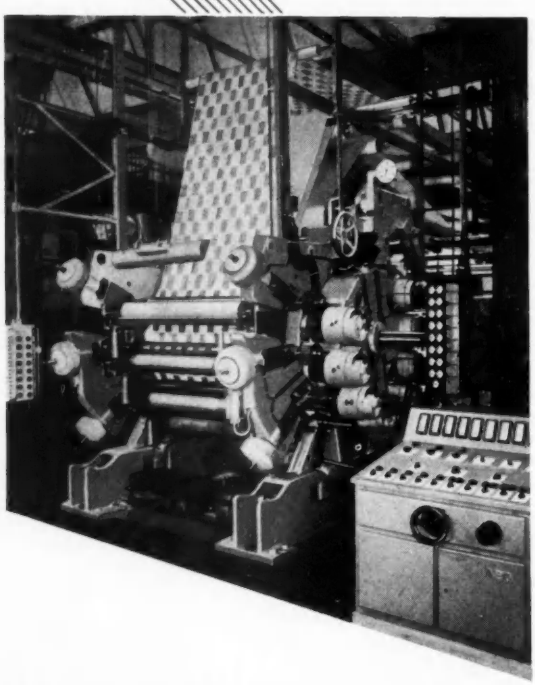
From the beginning we have been aiming the greatest accomplishment in the design of our printing plants.

The results hitherto achieved are :
Printing speed 150 m/min., continuous service fully automatic controls, pneumatically controlled precision ratio gear adjustment without individual motors, pneumatic pressure up to 5 tons per printing roller and side, separate drive for doctor blades, roller bearings for cylinder and mandrils as well as infinitely variable speed drive for the complete plant.

There are thus certain outstanding technical achievements which have been accomplished for the first time in the design of printing machines and which have now stood the test of actual practical applications in many of our customers' works.



An important auxiliary unit of the printing plant : Darex-Washer.



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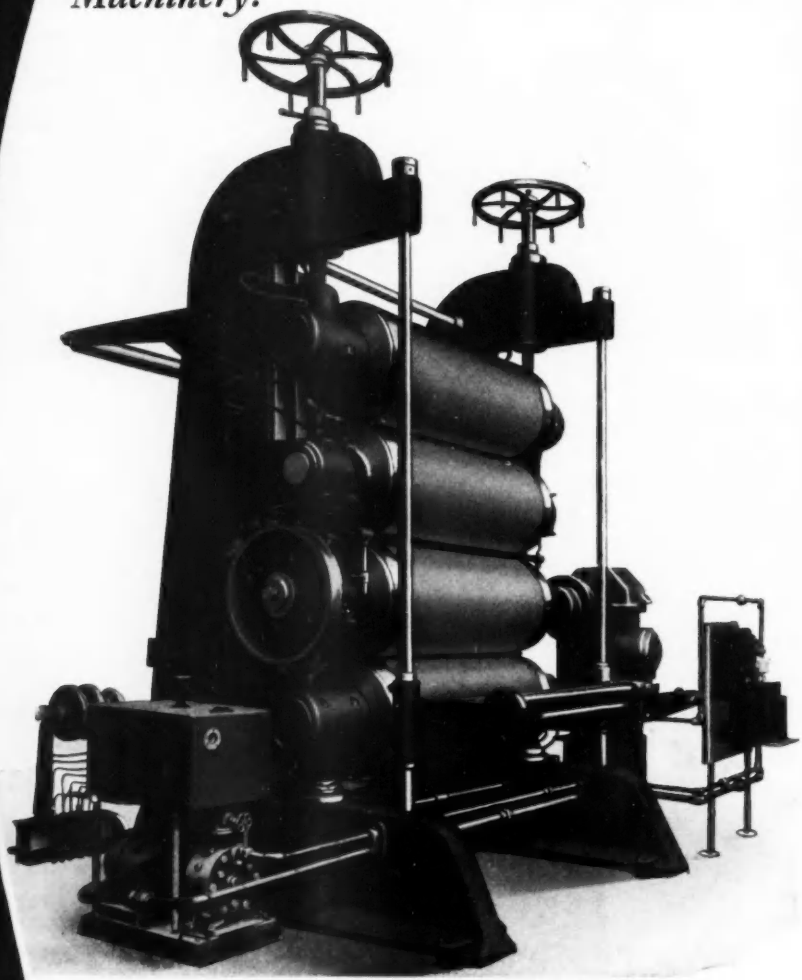
Lang Bridge can still offer a complete service in design, manufacture and erection of Bleaching, Printing, Dyeing & Finishing Machinery.



4 BOWL HYDRAULIC CALENDER

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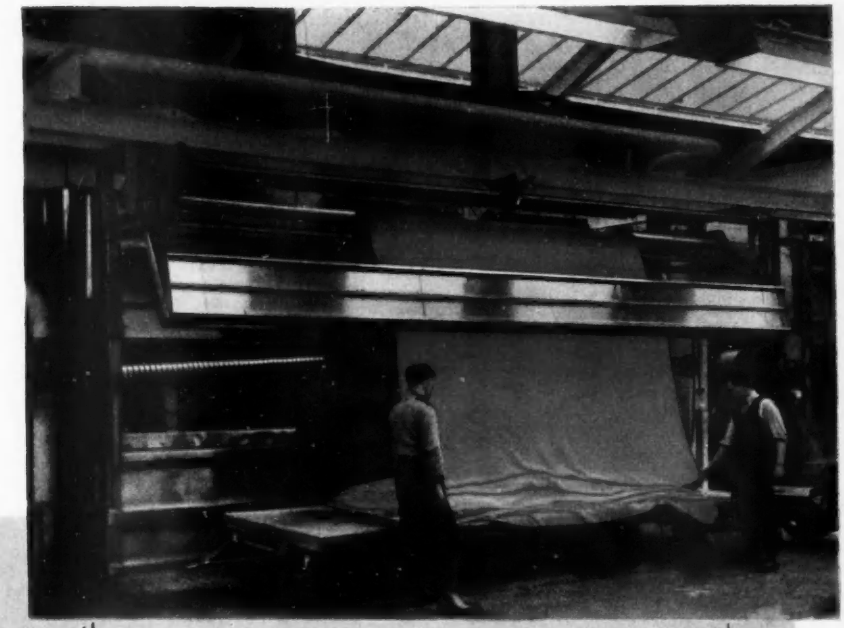
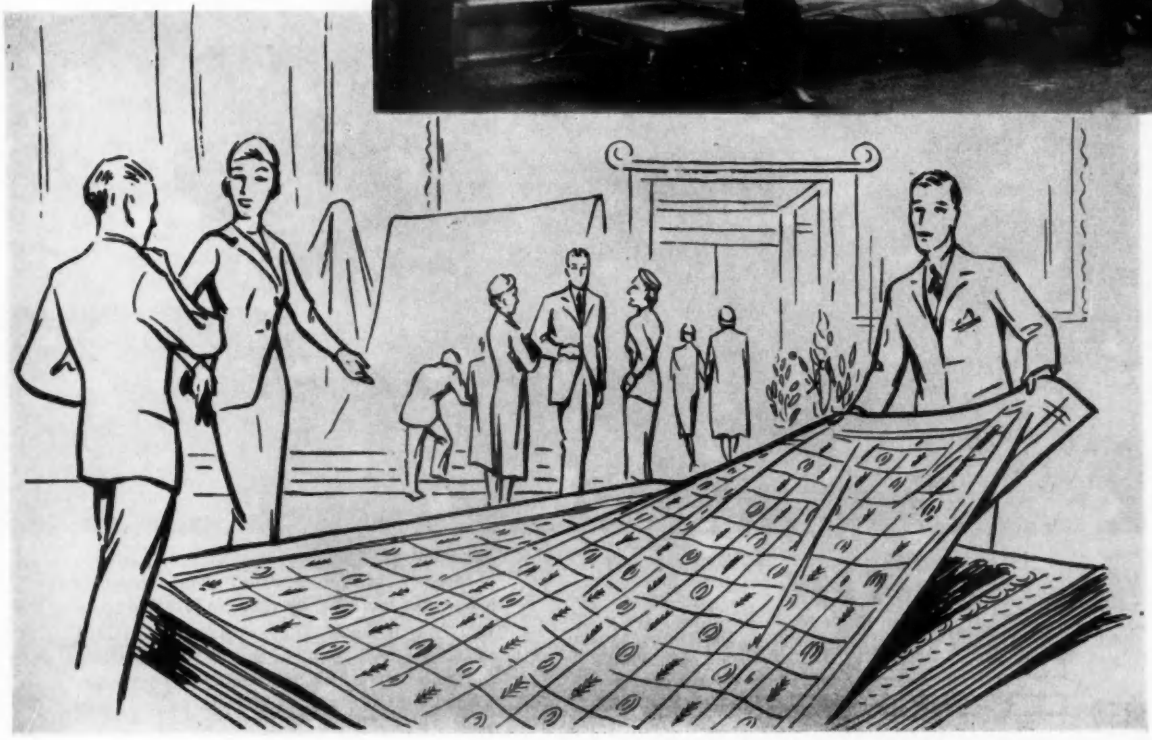
behind the scenes . . .





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"Staybrite" STAINLESS STEEL

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GEAR BOX

The P.I.V. gear itself provides an infinite variation of speeds within a range of 6/1 giving, according to size, speeds of 1716/286 r.p.m. to 1225/204 r.p.m.

These speeds can be reduced to as low as 1·2/0·2 r.p.m. by using a Compound P.I.V. gear, whereby an auxiliary reduction unit of spur or worm gears is fitted integral to the P.I.V. gear.

By using the "E" type of Compound gear the range of speeds may be extended to 700 to 0 r.p.m. or plus 350 to minus 350 r.p.m. The power capacity extends from ½ to 20 h.p.

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Also manufacturers of Worm Reduction Gears, Piece Goods Stamping Machines and Light Alloy Bobbins for the Textile Trade.

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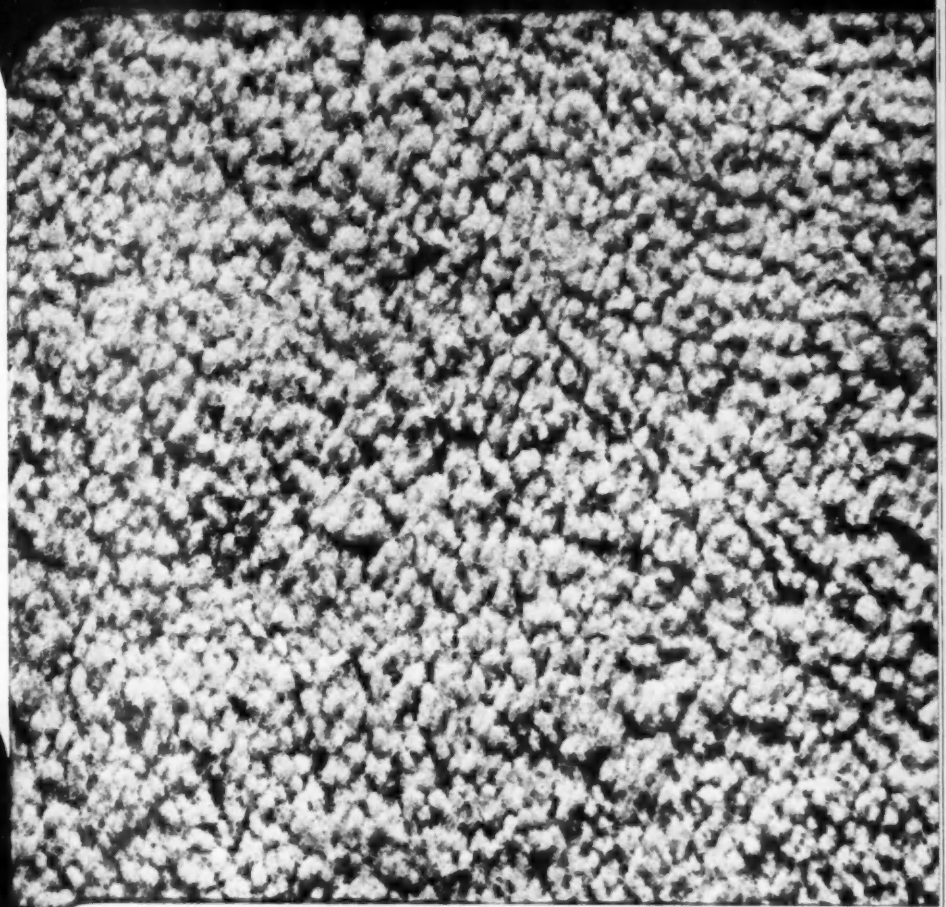

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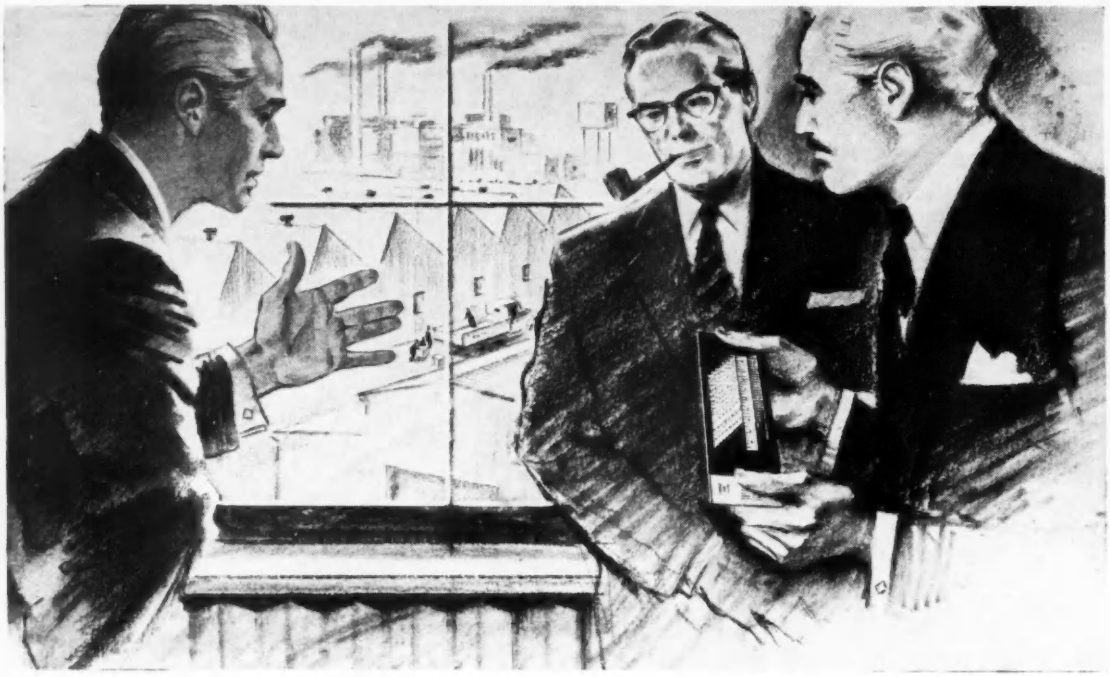

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We saw what the saving by oil would be—apart from less labour and space—and knew the efficiency we'd get as well as being half way to automation! A happy day for our production when we called for the FINA Fuel Oil Technical Advisory Service and of course

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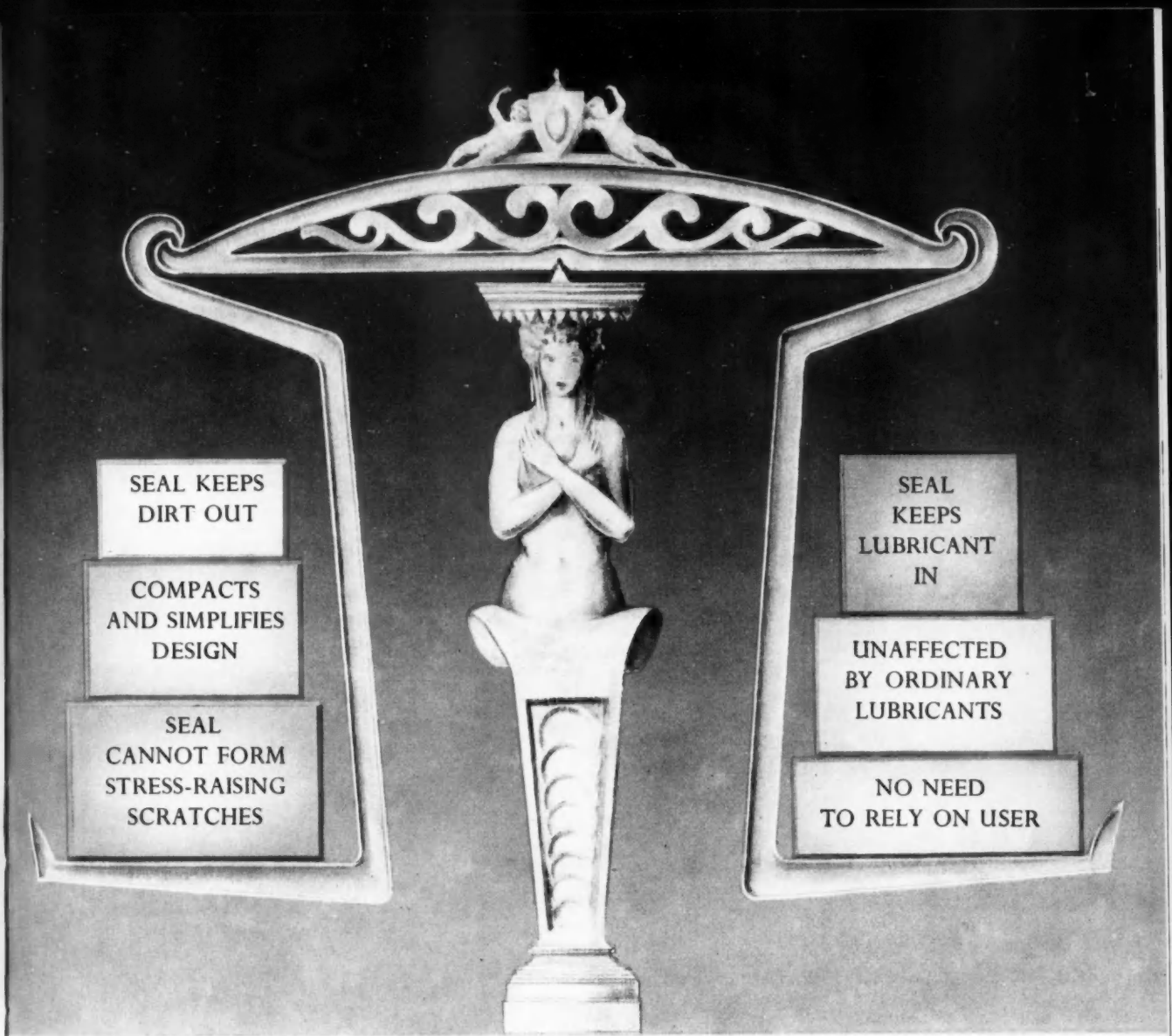
SEAL KEEPS DIRT OUT
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SEAL CANNOT FORM STRESS-RAISING SCRATCHES
SEAL KEEPS LUBRICANT IN
UNAFFECTED BY ORDINARY LUBRICANTS
NO NEED TO RELY ON USER

WEIGHING THINGS UP

or keeping stuff out and keeping stuff in

It is difficult to give a casting vote—it's no good loading a bearing with enough lubricant for a long life, if the dirt can still get in.

Moreover it's no good just keeping the dirt out if the lubricant escapes and leaves the designer in a fool's paradise, with the bearings dry.

As we and many important users see it, the whole combination of advantages goes together. The sealed bearings are exactly interchangeable with standard FBC and other bearings, and can be supplied with the seal on either one or both sides.

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ALL-BRITISH
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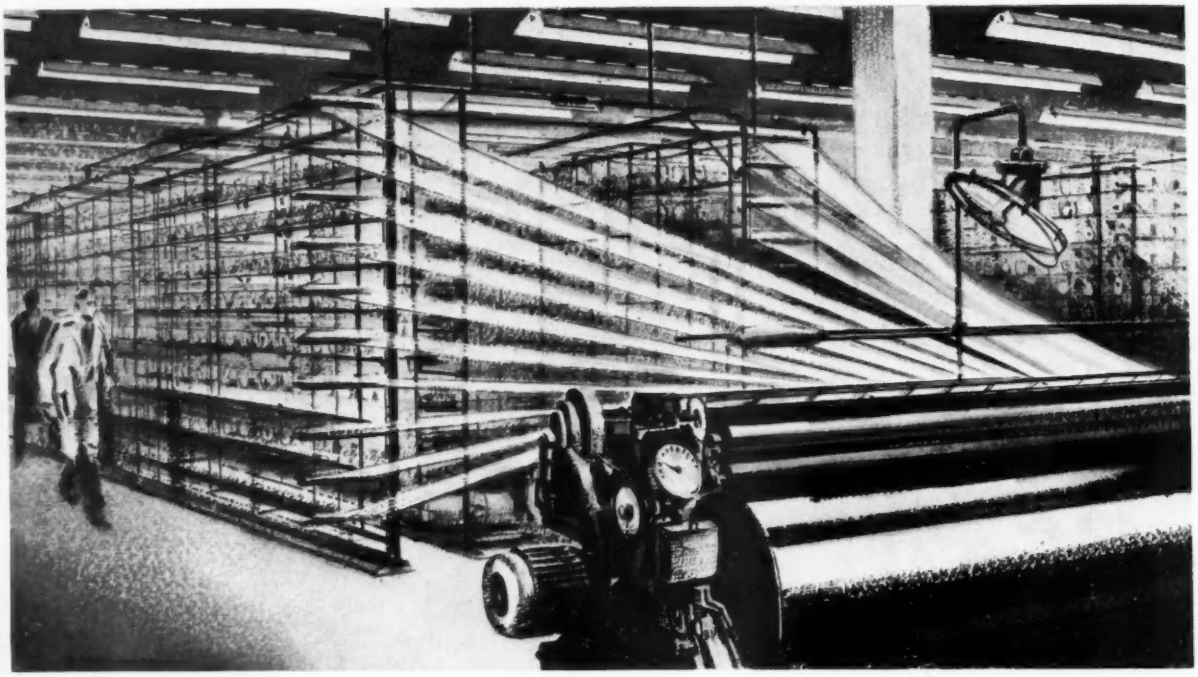
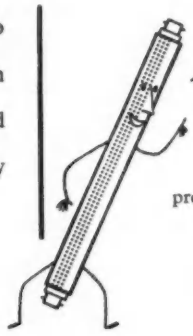
Fischer Bearings Company Ltd., and Timken-Fischer Stockists Ltd., Birmingham, are both subsidiaries of British Timken Ltd.

Light Speeds Production

In the manufacturing industries the right lighting in the right place means accurate work and full production efficiency.



EKCO fluorescent fittings and tubes are designed to give high levels of illumination at low cost. With reflectors and diffusers made from stoved-enamelled metal, P.V.C. or Perspex, these fittings are readily cleaned and easily maintained.



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The EKCO trunking system has been designed with present and future requirements in mind. The flexibility of the system permits the re-lighting of working areas quickly and simply. Your nearest EKCO office will be glad to help you plan your trunking system.

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SILENTBLOC ENDLESS EXTENSIBLE SPINDLE BANDS

produce better yarn and more of it by eliminating spindle speed variation and giving a long trouble-free life at high speeds. They drive with just the right degree of tension and thus save not only power but wear on bolsters and spindle footsteps. Silentbloc bands are unaffected by oil or atmospheric changes. Available in running lengths of 30″ and upwards. Diameter $\frac{1}{8}$″. Endless elastic bands of $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{3}{8}$″ and $\frac{1}{2}$″ diameter can be provided for Fly Comb and other heavier drives where a band thicker than the standard $\frac{1}{8}$″ diameter mule spindle band is required.

There's no mistaking Silentbloc bands. Their finish and red colour distinguish them as the best spindle bands on the market.

Can we send a representative to show you a sample?

SILENTBLOC LTD., MANOR ROYAL, CRAWLEY, SUSSEX. Tel: CRAWLEY 2100

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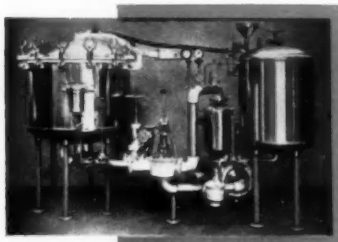
PEGG

PRESSURE DYEING MACHINES

A complete range of machines for dyeing all types of fibre in every stage of manufacture, including loose, top, beam, hank and package forms. Also rapid package drying machines.



HANK DYEING MACHINES

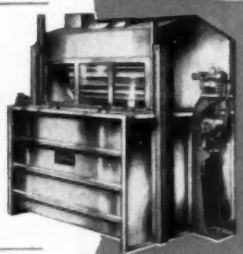
Built in stainless steel in capacities ranging from 25 to 1500 lbs. for all classes of wool, worsted, mixture and linen yarns in hank form. Machines may be coupled together.

LOOSE STOCK DYEING MACHINES

For all classes of loose stock, rags and synthetic fibres, in 3 capacities of 10–50 lbs., 100–250 lbs. and 200–600 lbs. Stainless steel construction.

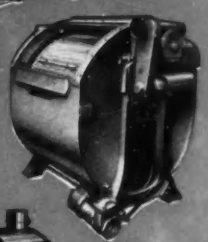
PIECE GOODS DYEING MACHINES

A comprehensive range of machines available in stainless steel for dyeing all types of woollen or worsted piece goods, silk or rayon fabrics and knitted fabrics in rope form. Also carpet dyeing machines.



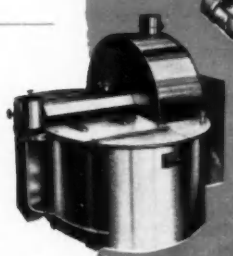
ROTARY DYEING MACHINES

Totally enclosed rotating drum machine for dyeing nylon, pure silk, rayon and cotton hose with perfect penetration and uniformity. Stainless steel in 25, 50, 100, and 200 lbs. capacities.



PADDLE DYEING MACHINES

A versatile machine, in stainless steel, for ladies' hose, half hose, and loose articles. Also used for anti-shrink and bleaching. 4 capacities from 12–200 lbs.



DYEING AND FINISHING MACHINES

Builders of dyeing machines for loose stock, hanks, packages, piece-goods, fabric and hose; also finishing machines for all classes of circular knitted and warp loom fabrics and garments. Pre-boarding and finishing machines for nylon hose.

A Member of the Bentley Group

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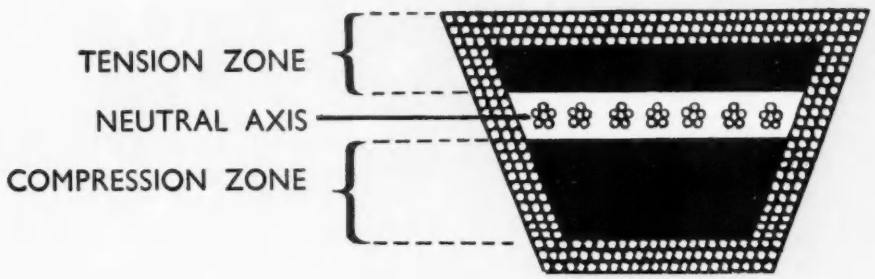

IN THEORY

AND IN PRACTICE

Send for Broadsheet BA56/ L giving complete mechanical data and details of increased h.p. ratings achieved using Turners Rayon Cord 'V' Belts.

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RAYON CORD V BELTS

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A MEMBER OF THE TURNER & NEWALL ORGANISATION

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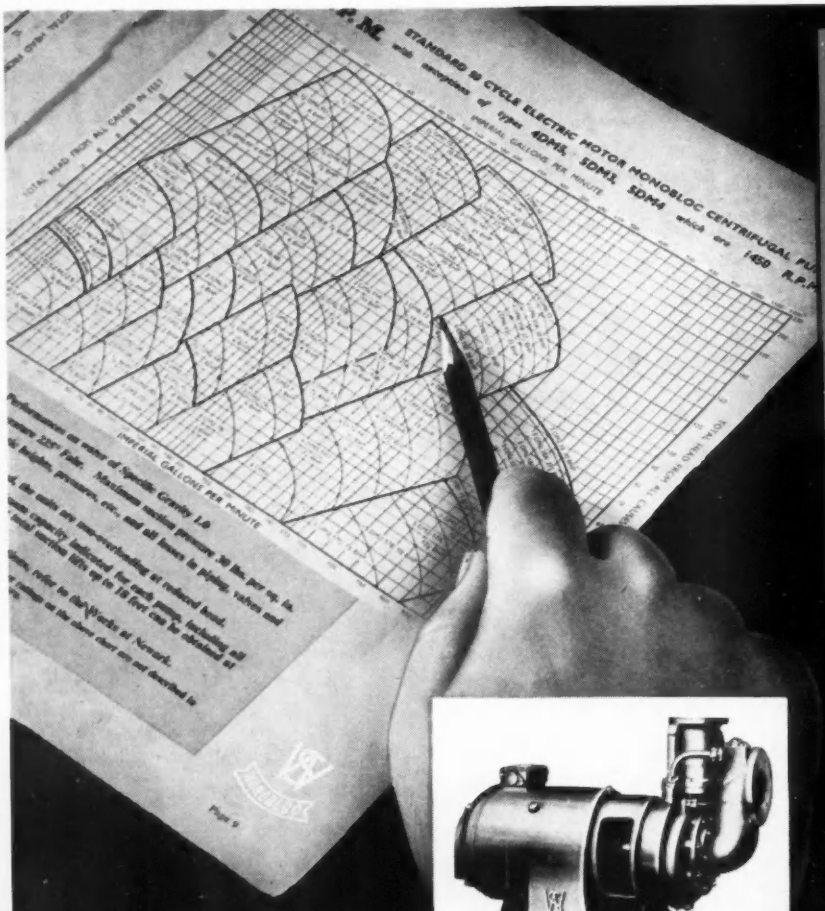

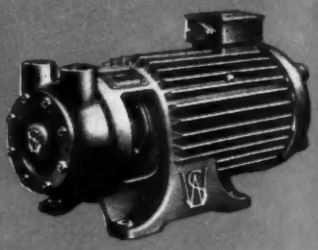

TYPE TM

SMALL CAPACITY
HIGH HEAD SINGLE-STAGE PUMP

For handling up to 1800 G.P.H. and heads up to 300 feet.

Patent No. 591835

the right pump

for the job

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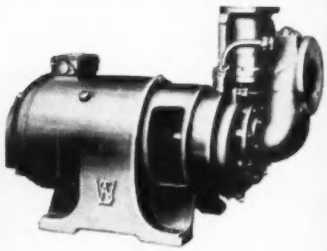

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For capacities up to 350 g.p.m. and heads up to 130 feet, available in sizes 1" to 3" and 1 to 20 B.H.P.

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In capacities from 10-200 g.p.m. and heads up to 380 feet.

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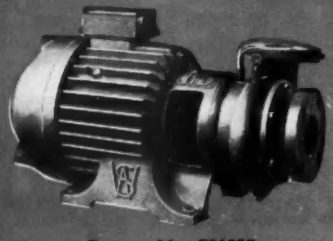

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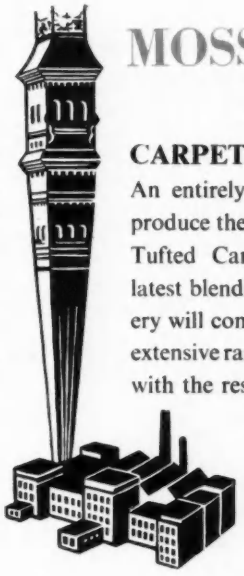

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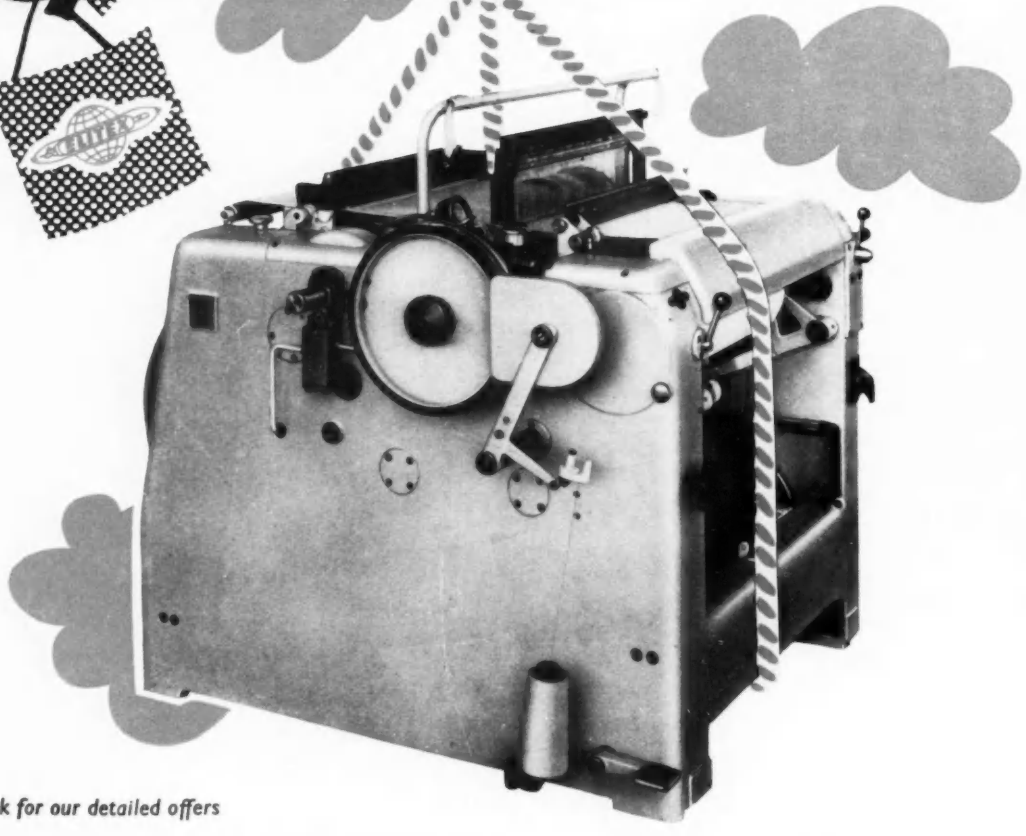

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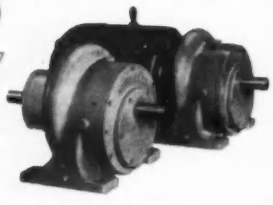

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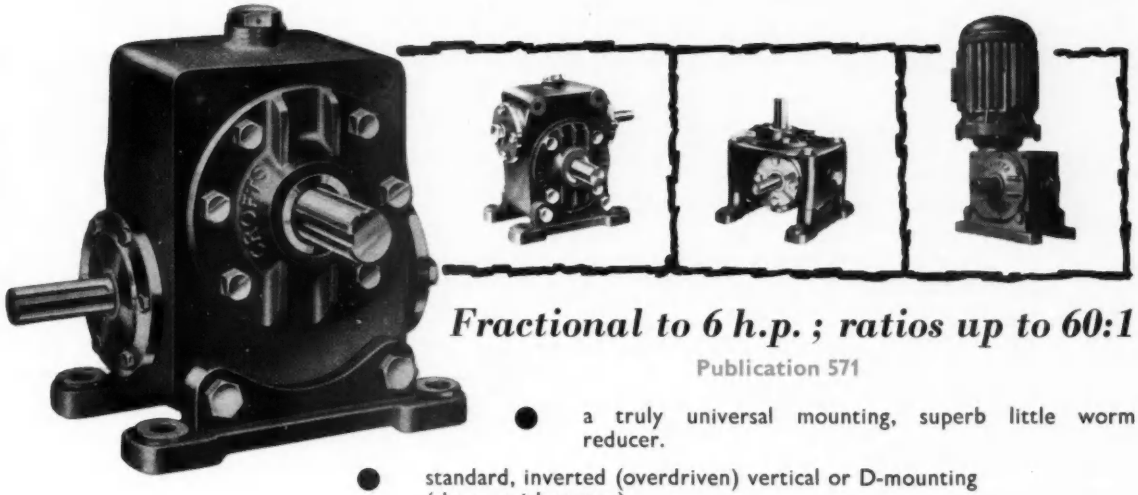

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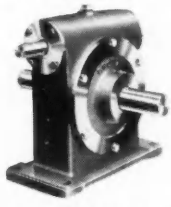

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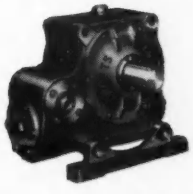

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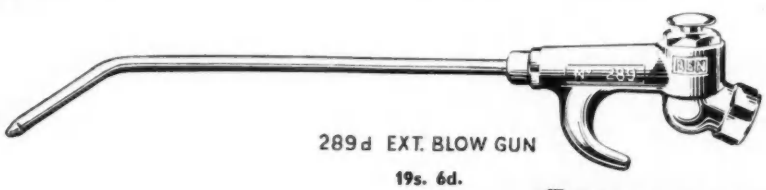

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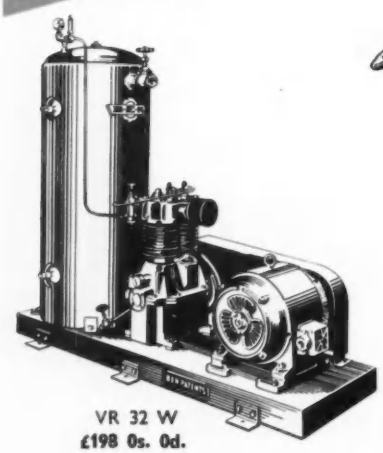

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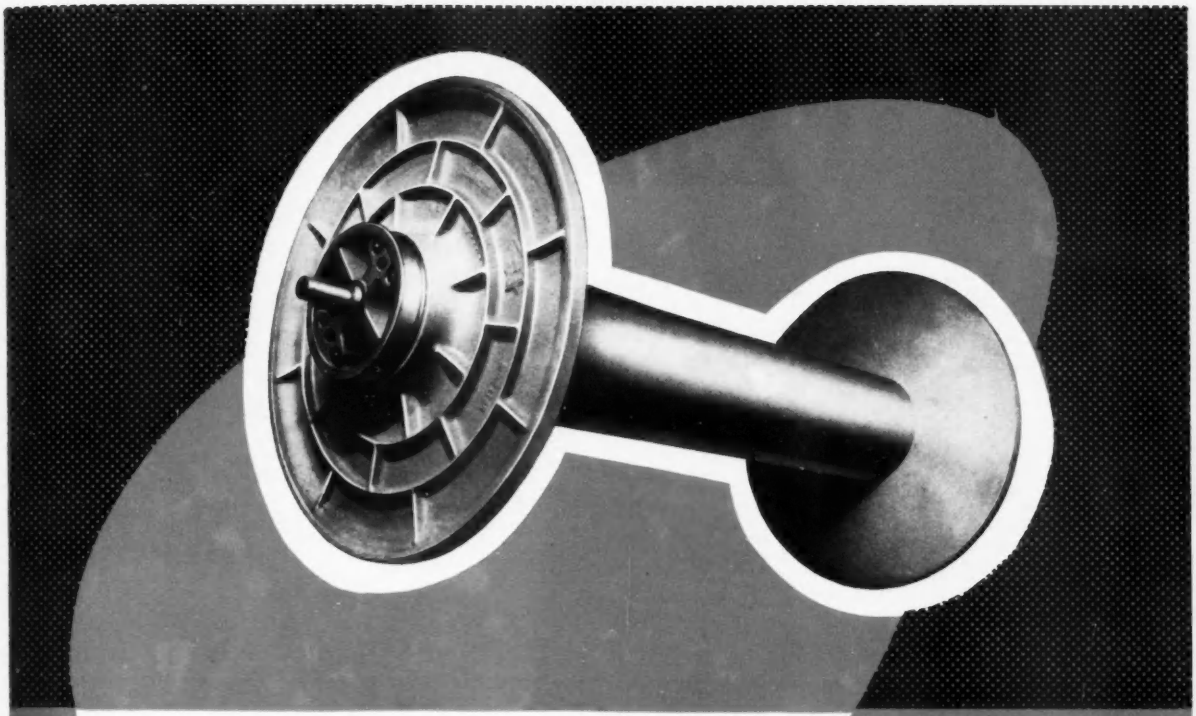

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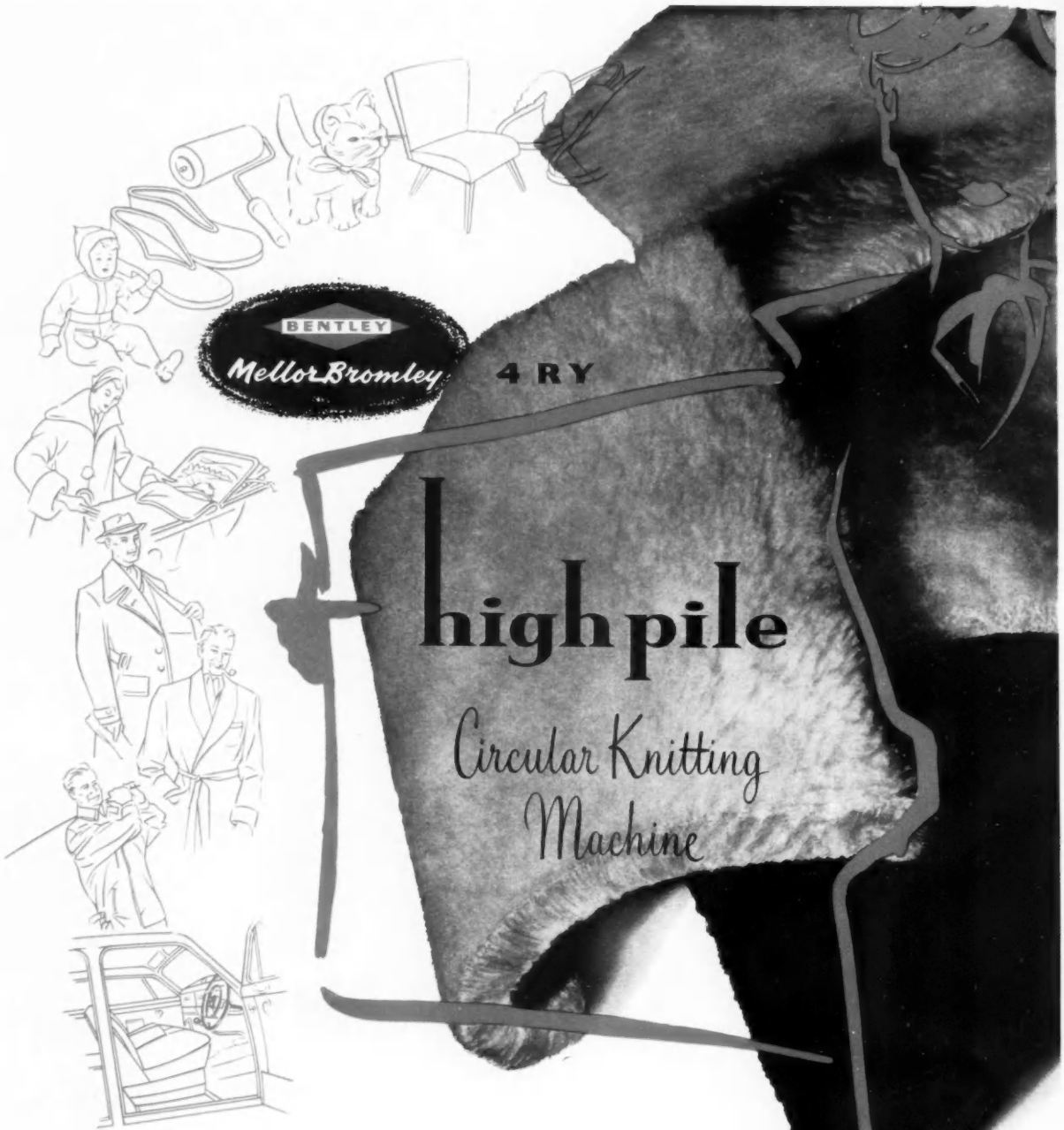

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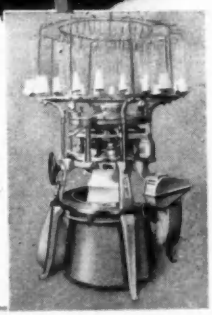

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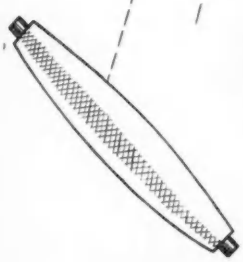

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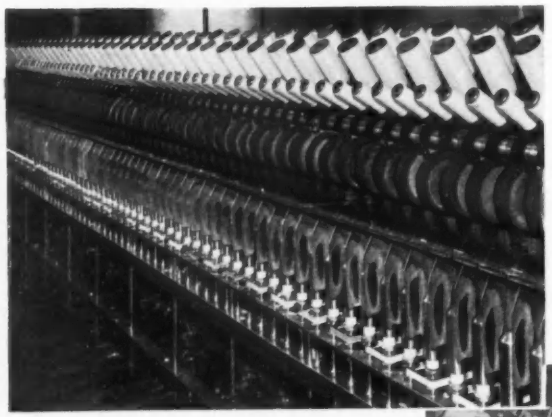

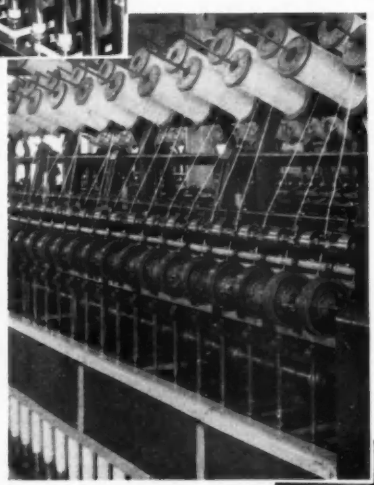

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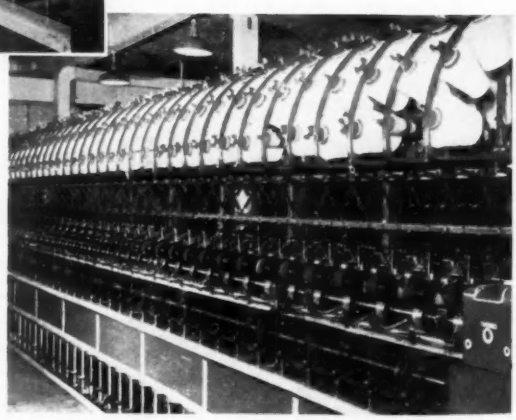

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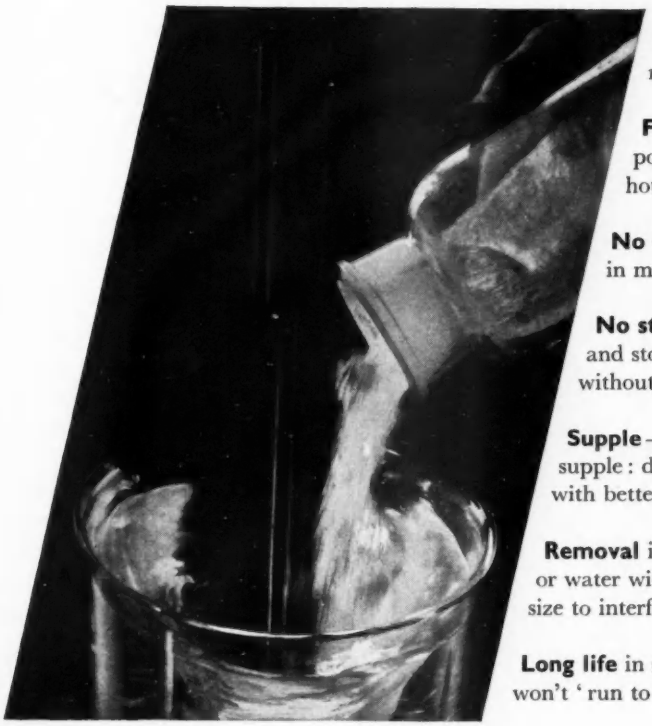

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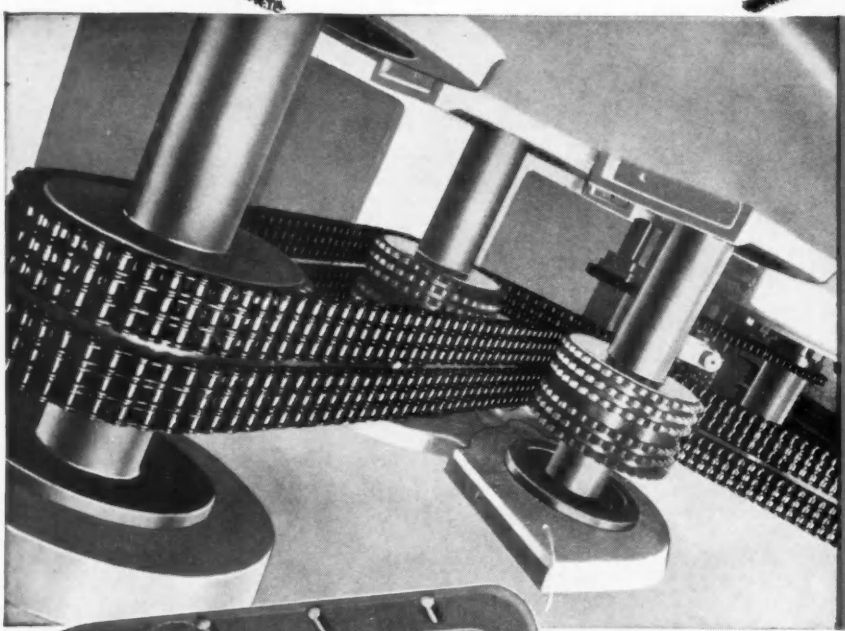

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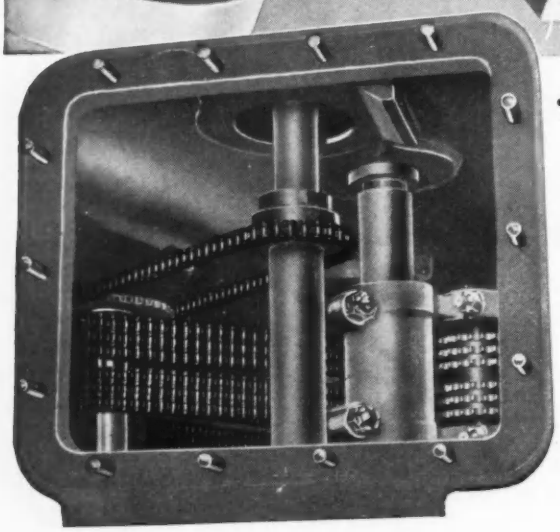

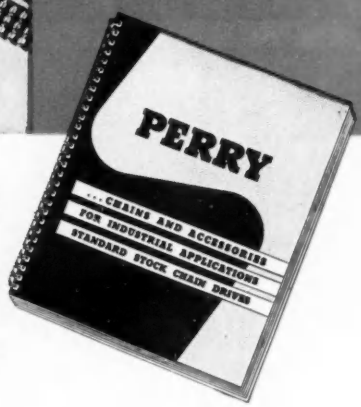

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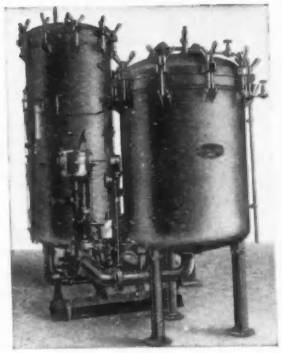

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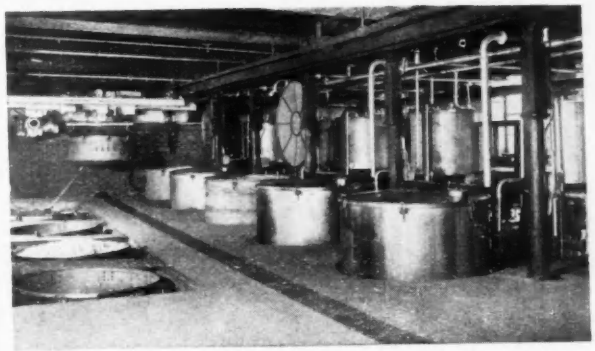
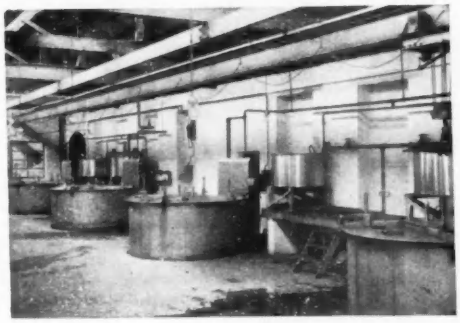


Longclose Conical Pan Machines for many types of loose material—highly mechanised operation for bulk production



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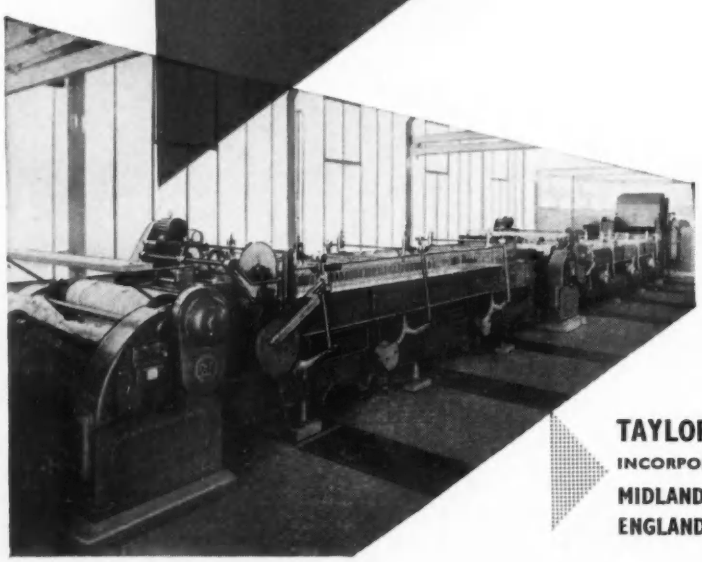

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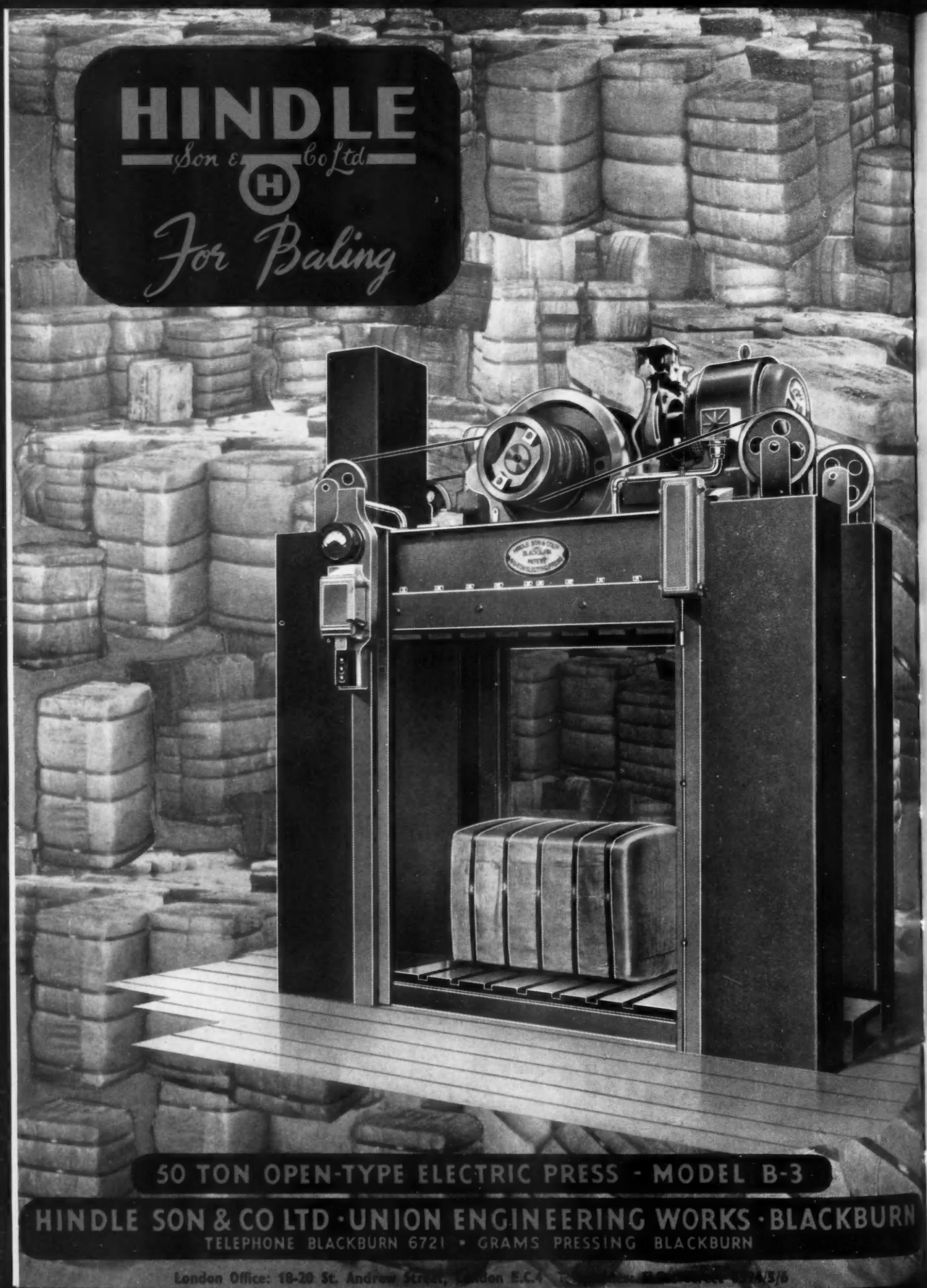
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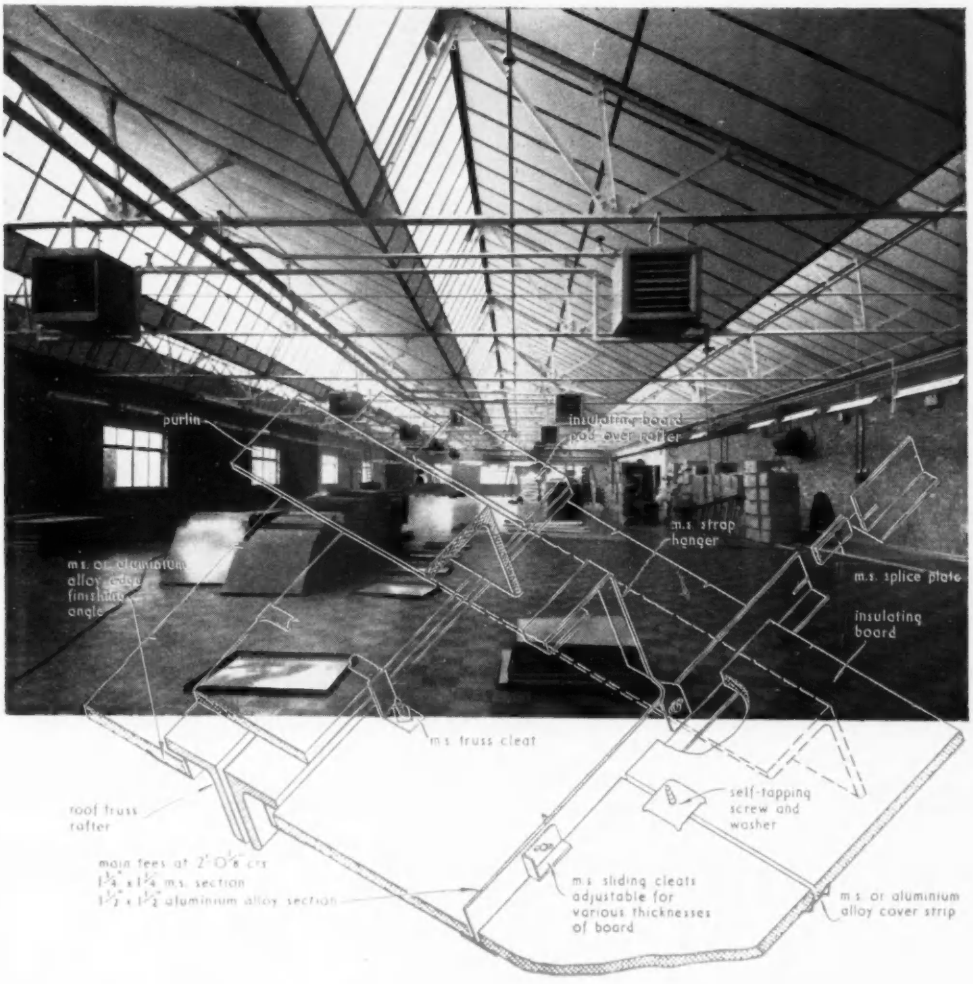
TELEPHONE BLACKBURN 6721 • GRAMS PRESSING BLACKBURN
London Office: 18-20 St. Andrew Street, London E.C.4

Thermal Insulation of Buildings


purlin
insulating board pad over rafter
m.s. strap hanger
m.s. or aluminium alloy edge finishing angle
m.s. splice plate
insulating board
m.s. truss cleat
roof truss rafter
self-tapping screw and washer
main tees at 2'-0⅛" crs
1¾" x 1¾" m.s. section
1½" x 1½" aluminium alloy section
m.s. sliding cleats adjustable for various thicknesses of board
m.s. or aluminium alloy cover strip

The above illustration shows Heywood's under-purlin system of fixing, suitable for steel or aluminium alloy tee sections with wood pulp and asbestos insulation board, plasterboard etc., for the thermal insulation of buildings.

The system is applicable to flat or curved roofs and is ideal for suspended ceilings.

Glass - Silk, Aluminium foil or other blanket insulation material can be incorporated.

HEYWOODS
OF HUDDERSFIELD

Heat loss through roofs and walls of industrial buildings is heat wasted, — fuel wasted, — money wasted. Heywood's efficient Thermal Insulation of buildings KEEPS HEAT IN ITS PLACE and upwards of 50% reduction of heat loss is assured.

Installation in existing premises provides economy for the future. Planned in advance for new structures substantial reduction in capital expenditure for heating equipment can be realized, and resultant economies maintained.

Information Sheets and further details gladly supplied. Please ref : Dept. SPEC/H.

Where appearance is of special importance, our system of concealed fixing provides a particularly attractive element with factual efficiency.

W. H. HEYWOOD & CO. LTD., HUDDERSFIELD. Tel. 6594 (5 lines)

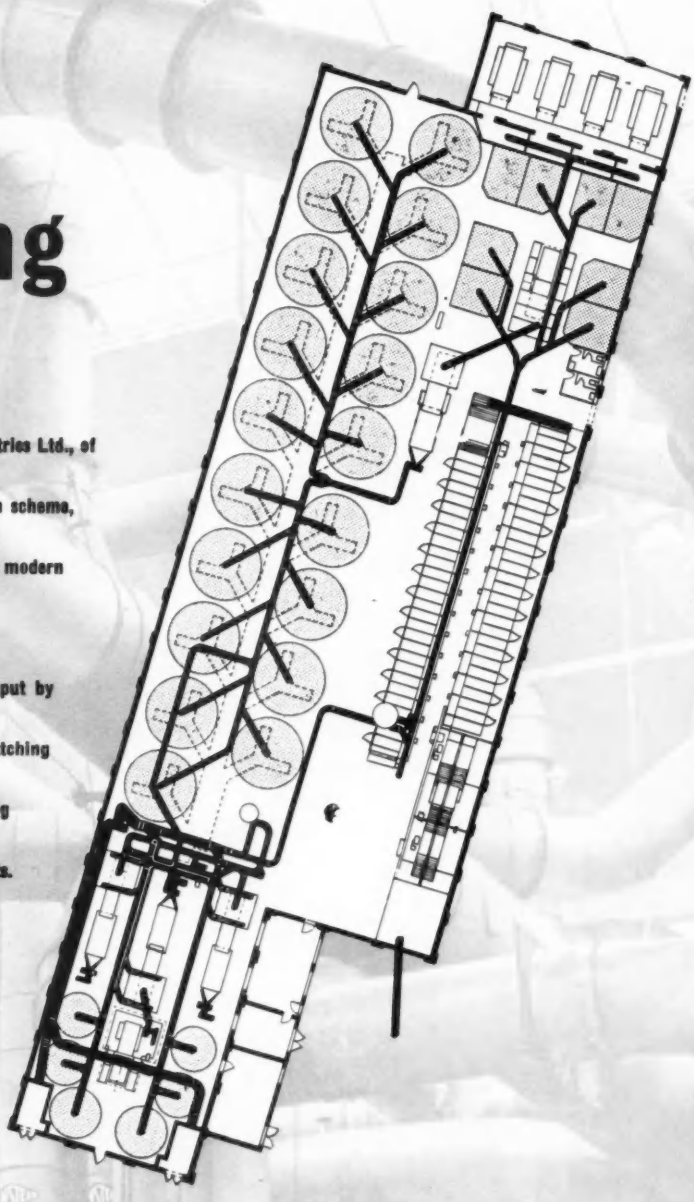
Branches at: London, Manchester, Glasgow, Belfast, Newcastle, Birmingham, Liverpool, Leicester, Nottingham, Bristol,
Associate Company in Eire: W. H. Heywood & Co. (Ireland) Ltd. 63-64 Upper O'Connell Street, Dublin.

SPENSTEAD

blending plant

was supplied to Messrs. Petmar Industries Ltd., of Batley for their £1 million expansion scheme, making it one of the largest and most modern fibre and carpet plants in Europe.

This new plant greatly increases output by simplifying standardisation and the matching of colour and quality whilst effecting considerable savings in production costs.



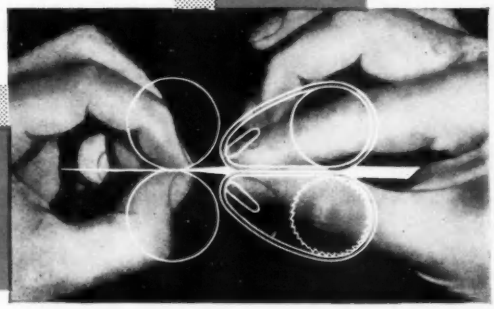
SPENSTEAD

the complete system was designed, constructed and installed by

SPENCER & HALSTEAD LIMITED

BRIDGE WORKS OSSETT YORKSHIRE

OSSET 821/4 (4 lines)



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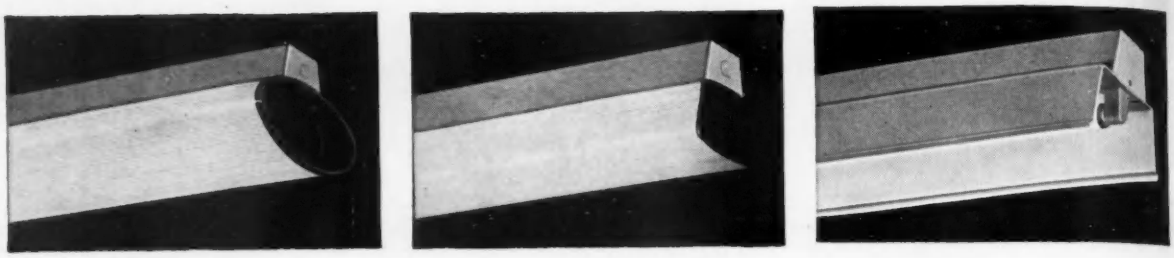
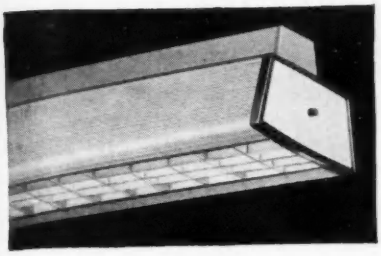
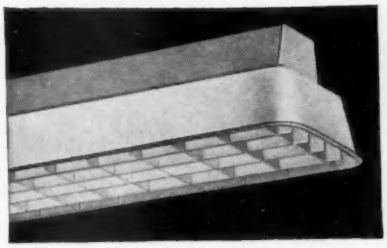


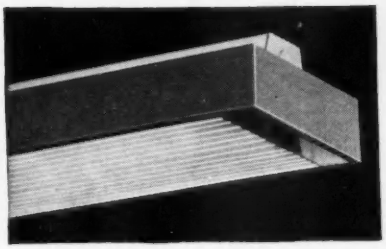
what's so new about fluorescent fittings

THE GENERAL ELECTRIC CO. LTD,

MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.







these anyway?

Everything is new! *The '101 Range' is an entirely new range of contemporary styled industrial, commercial and decorative fluorescent fittings. The successful result, in fact, of team work between G.E.C. fittings designers and illuminating engineers. Competitively priced—outstandingly modern in conception! NEW also is the introduction of basic channels for single or twin tubes, 1½ ft. to 8 ft. which, with specially designed attachments, form an interchangeable system of great versatility with particularly simple installation and maintenance. It is important that you learn all about this exceptional range —the '101 Range'—of G.E.C. fluorescent fittings, so write for fully descriptive catalogue No. F 4068.*

new adaptability

The G.E.C. '101 Range' sets a *new standard* of adaptability. Using as a basis, channels of common cross section, industrial, commercial and decorative fittings are built without a multitude of small parts. Each is a soundly engineered fitting, of modern appearance and incorporates many aesthetic and mechanical refinements. Installation and maintenance are absolutely simple.

new reflectors

For the first time the industrial user can have vitreous enamelled closed end trough reflectors made from a single pressing, with well-rounded corners and without joints. They are therefore particularly easy to clean. New techniques enable them to be made lighter than previous types and therefore easier to handle and less susceptible to damage.

new 8 ft. tubes

Recessed double contact (R.D.C.) caps are fitted to OSRAM 8 ft. 125 w. tubes for use in the '101 Range'. This new cap design protects the tube ends and allows replacement by one person from one ladder position. Recessed double contact caps also provide firm, reliable support and location for these tubes without relying on contact pins or independent clips. This results in easier tube replacement after cleaning or maintenance. Unsightly shadows are reduced, as the new cap gives a smaller "dead region" at tube ends. Osram Guaranteed Tubes, with their freedom from early failures, are recommended for all G.E.C. lighting fittings.

G.E.C. range

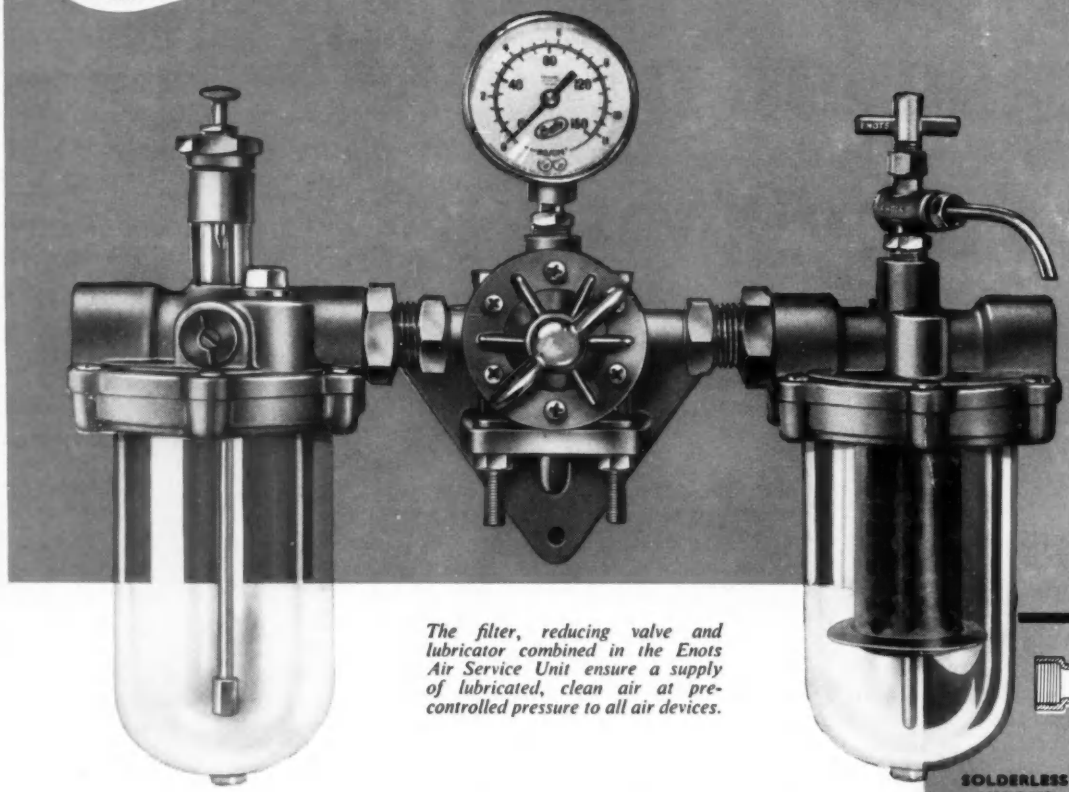
fluorescent fittings

THE REALITY OF A COMPLETE LIGHTING SERVICE

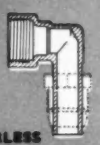
Enots

AIR SERVICE UNITS
and PNEUMATIC EQUIPMENT

improve efficiency and reduce production costs



The filter, reducing valve and lubricator combined in the Enots Air Service Unit ensure a supply of lubricated, clean air at pre-controlled pressure to all air devices.



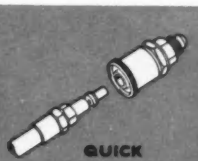
SOLDERLESS UNIONS

BLOW HOSE NOZZLE VALVES

A pressure reducing valve fitted to almost any pneumatic device will save its cost in a very short time by reducing air consumption. At how many points in your works are you using full line pressures of up to 100 lb. per sq. inch where 80, 60 or even lower pressures would be adequate? Savings are more or less in direct proportion to pressure reduction.

COPPER, BUNDY STEEL AND FLEXIBLE TUBES

EXHAUST SILENCERS



QUICK COUPLINGS

EJECTOR VALVES

LEAFLET AS357 describing our Air Service Units and individual components and other catalogues on Enots pneumatic devices are available on request.

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in an exciting advertising campaign . . . plus merchandising . . . plus display . . .

telling women to look for

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Colour-fastness to chlorinated water for swimsuits
Showerproofness for rainwear, etc.

So—in your own interest join

COURTAULDS TESTED-QUALITY PLAN

FOR APPLICATION FORMS WRITE TO:
Courtaulds Tested-Quality Department, Lockhurst Lane, Coventry.

STUBBS

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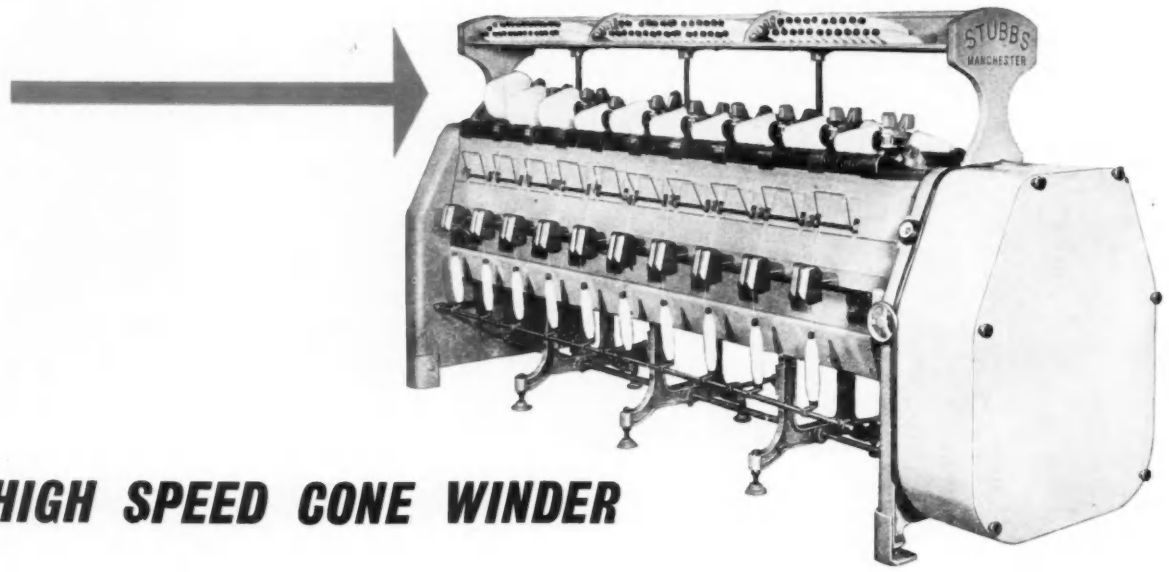

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Each head independently driven.

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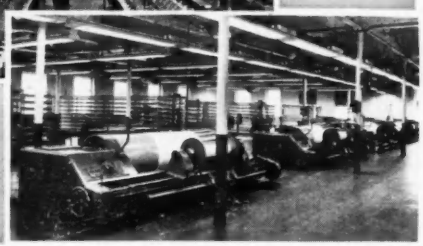

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FOR WEAVING. Nylon and "Terylene" on Cheese, Pirn or Beam. Silk Organzine and Tram.

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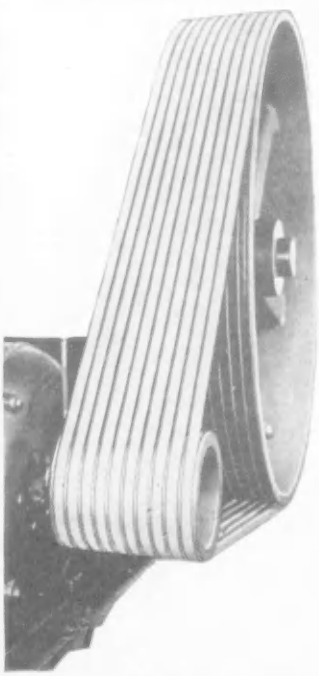
Makers of

"TEXROPE" V DRIVES



"TEXROPES" FOR TEXTILE DRIVING

FRANK WIGGLESWORTH & CO. LTD

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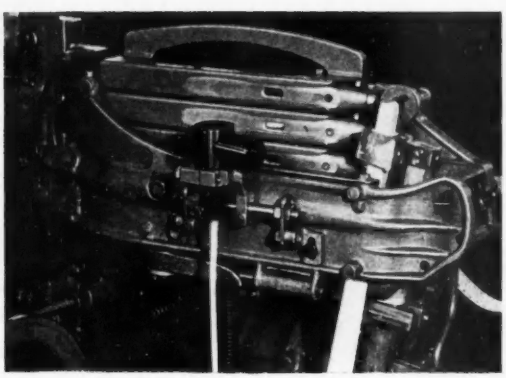
Reduce mending costs with the New features of interest on the . . SAURER Automatic 4 x 1 Worsted and Cotton Loom . .



Check these New Devices on the Saurer Loom eliminating Weaving faults—

1. **New** Large capacity Magazine (25 pirns for 2 colours and 15 pirns for the other 2).
2. **New** Magazine Scissors cutting the yarn between tip of the pirn and the Shuttle eye, inside the shuttle, combined with the special gripping device and removal device of loose length of yarn. This prevents trailing-in.
3. **New** spindleless Picking Device (fixed picker) on drop box side, with parallel picking motion.
4. Special rotating Quadrant Device for separating 4-ends on drop box side and eliminating lashing-in.
5. Equipped with double centre Weft Fork, and stop on pick ensured.
6. Electro-optical feeler (Loepfe) to eliminate damage to delicate weft and reduce waste yarn on pirns.

The loom is fully and easily convertible to the Saurer Semi-Automatic 4 × 4 pick and pick loom for up to 7 shuttles of which there are now many plants with weavers attending between 4 and 6 looms.

The Photographs show :
(Top left) Mechanical thread dividing device on drop boxes.
(Lower left) Fixed picker (drop box side and Loepfe electro-optical feeler
(Bottom) Loom showing shuttle eye scissors on box front

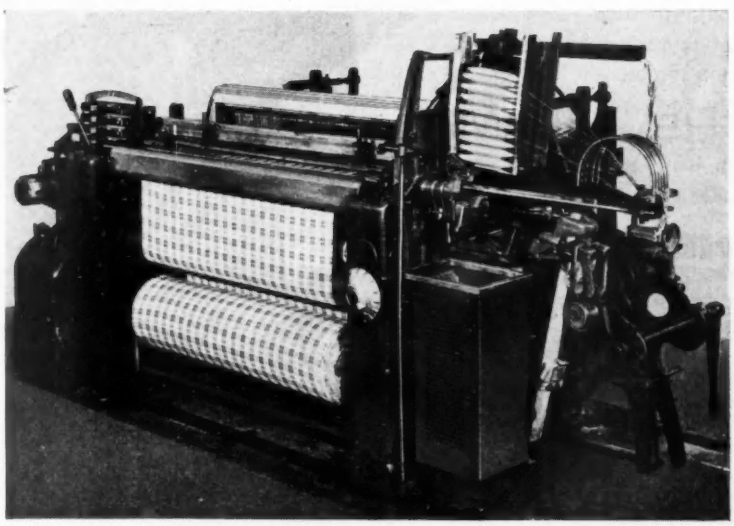
The

SAURER

COTTON & WORSTED

LOOM

with NEW Vertical Magazine



Manufactured in Switzerland by Adolph Saurer Ltd., Arbon. *Sole Agents in U.K., Eire and Canada*

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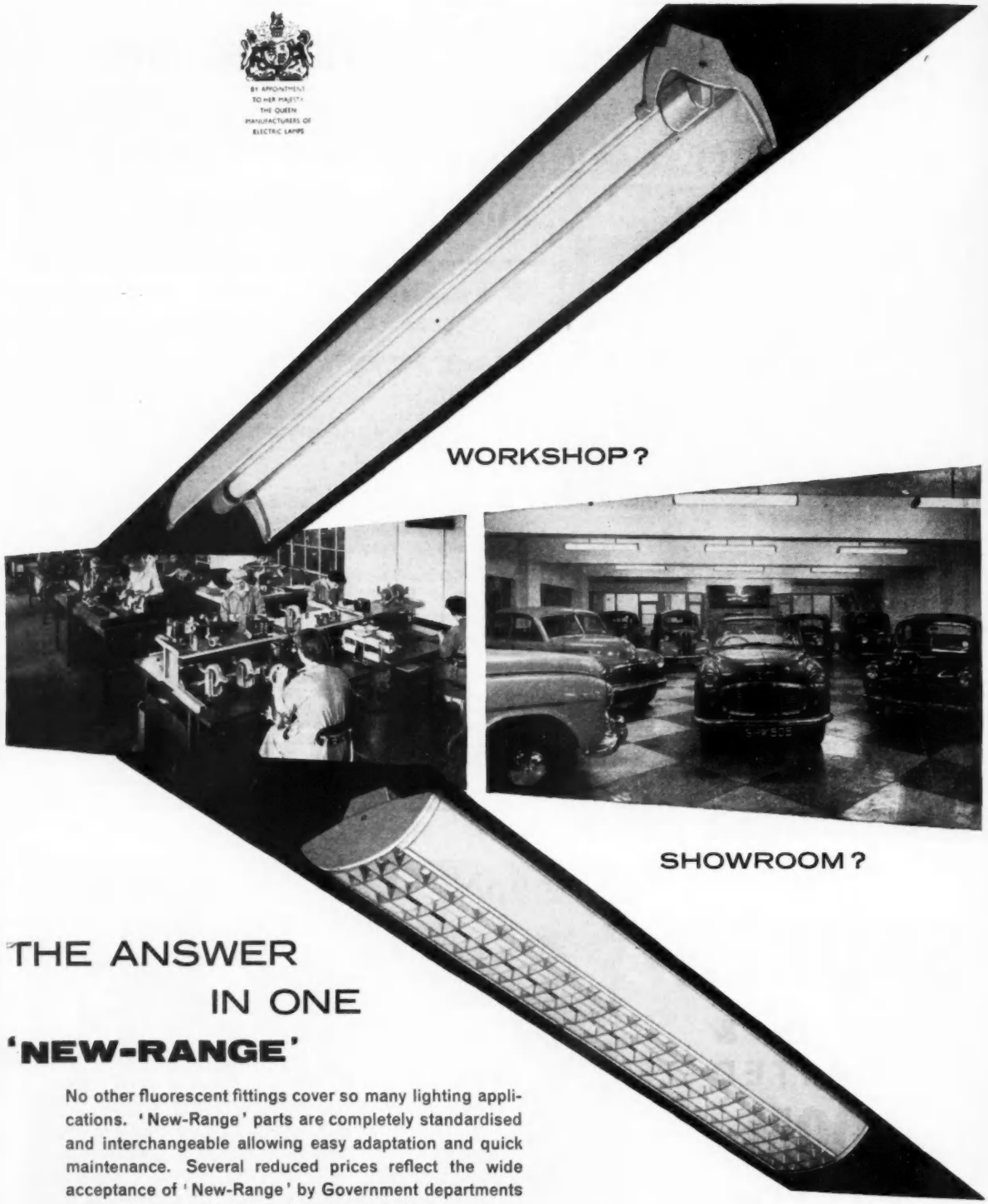

THE ANSWER IN ONE 'NEW-RANGE'

No other fluorescent fittings cover so many lighting applications. 'New-Range' parts are completely standardised and interchangeable allowing easy adaptation and quick maintenance. Several reduced prices reflect the wide acceptance of 'New-Range' by Government departments and by the largest buyers. New fast-installation features make possible further economies. All fixings for 'New-Range' are included in the pack.

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Crompton 'NEW-RANGE'

FLUORESCENT FITTINGS

Crompton Parkinson Ltd., Crompton House, Aldwych, London W.C.2.

"Uster" Varimeter for testing Picker Laps

This additional device for the "Uster" Evenness Tester, which is solidly built into the Picker serves for the testing of the irregularity of the weight per unit length in the Picker Lap. Through this new possibility of use the "Uster" Evenness Tester brings further optimum advantages to its present and future users.

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Not long surely, for smokeless coke and gas
will provide heat for any purpose more efficiently and economically.

Issued by the Gas Council

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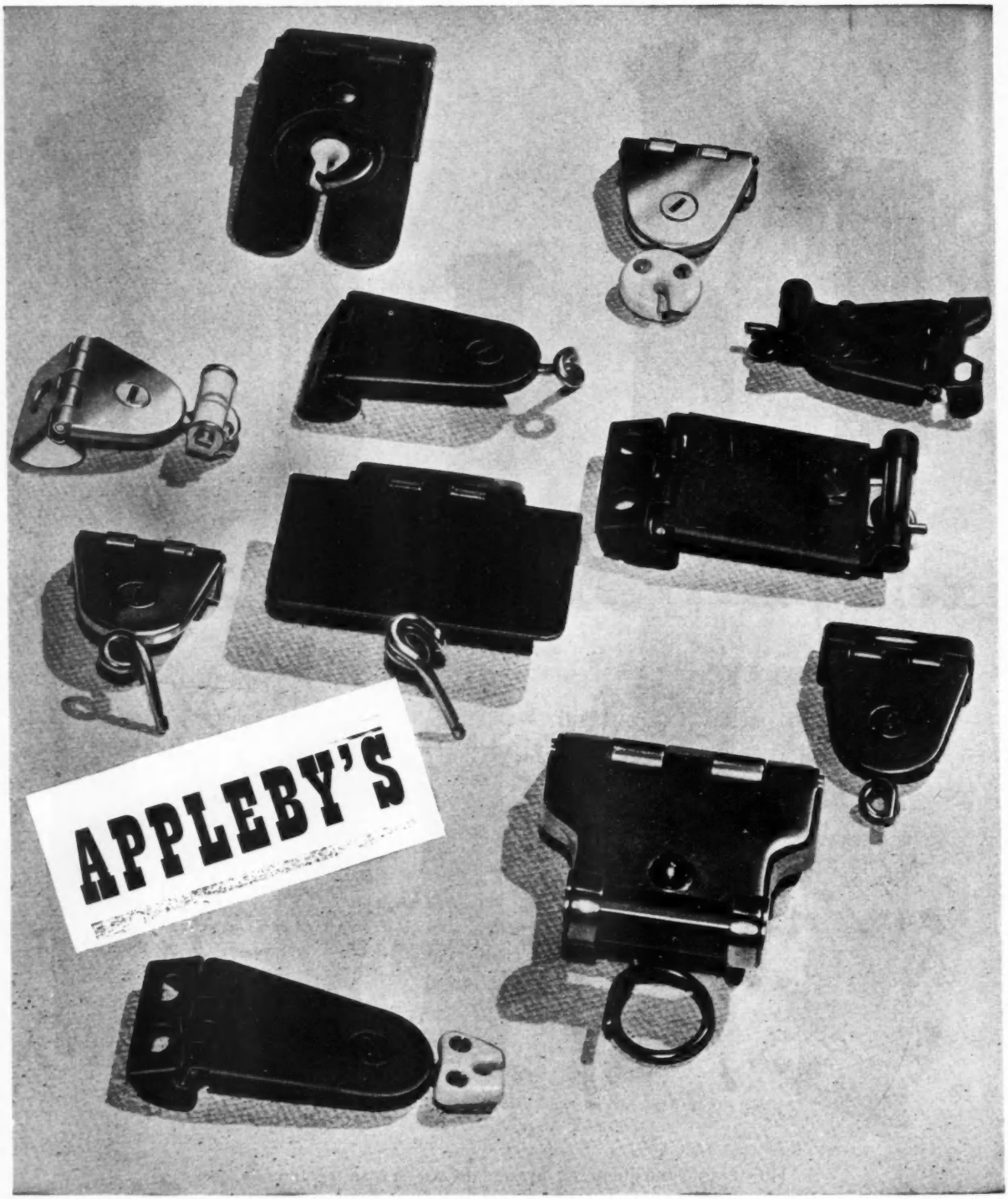

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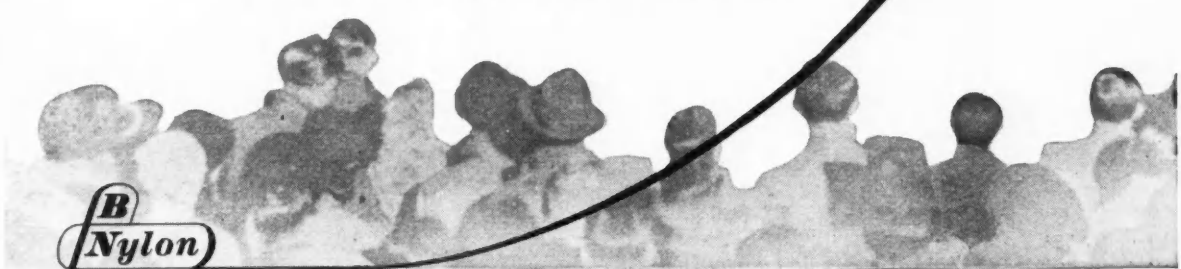

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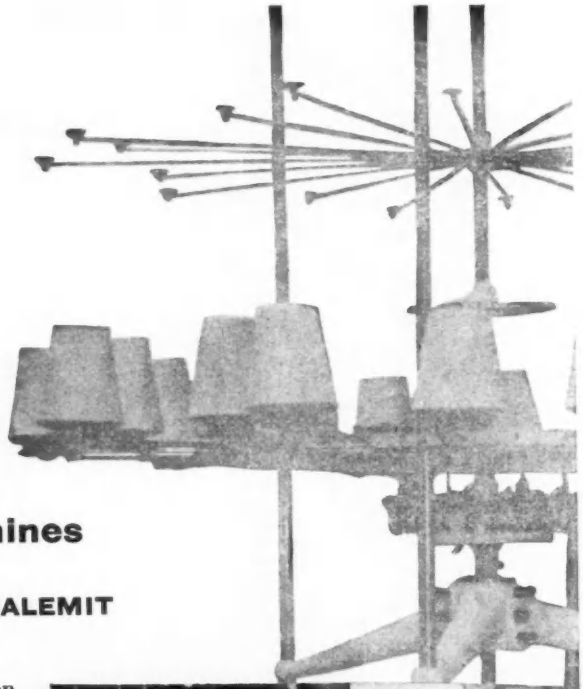


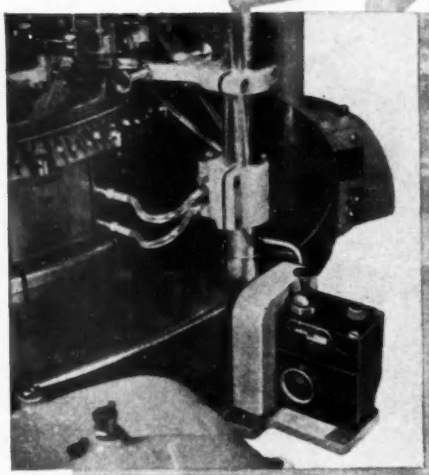
In America these advanced interlock machines

ARE LUBRICATED BY TECALEMIT

The fully-automatic Tecalemit 'Bijur' lubrication system was fitted as initial equipment, by Geo. Blackburn & Sons Ltd., of Nottingham, to important new interlock machines for Allen Knitting Mills Inc. This American firm expresses extreme satisfaction with the 'Bijur' fully-automatic lubrication system.

The 'Bijur' system of metered oil feed ensures that the correct amount of oil reaches the knitting elements at regular intervals, and automatically oils the needles and needle tricks.

So production time is increased by eliminating overheating and subsequent breakdowns. What's more, with 'Bijur' closed-circuit lubrication, no oil ever reaches the fabric . . . no 'fly' ever reaches the lubrication points. Every textile machine fitted with Tecalemit 'Bijur' lubrication has these advantages—making the initial cost well worthwhile.



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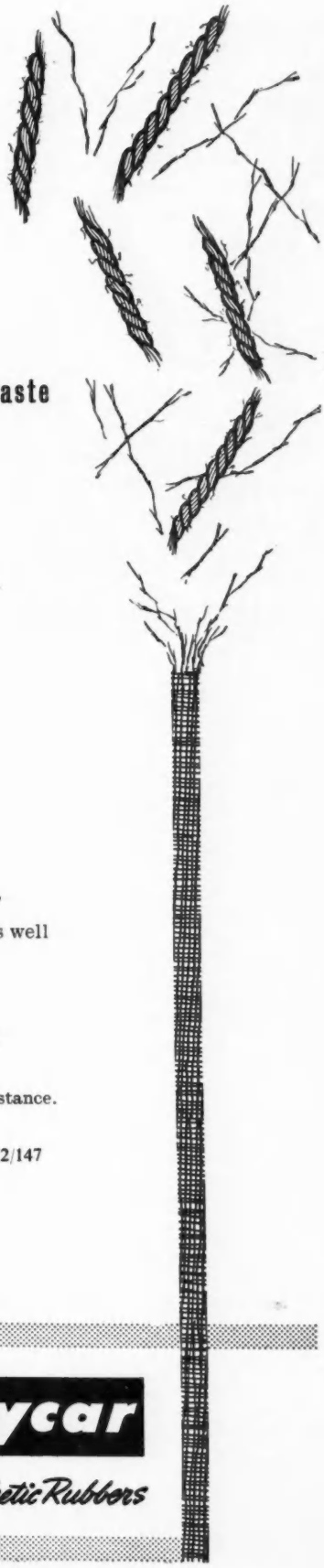
T601

Hycar

makes fibres into fabrics

without weaving . . . without felting . . . without waste



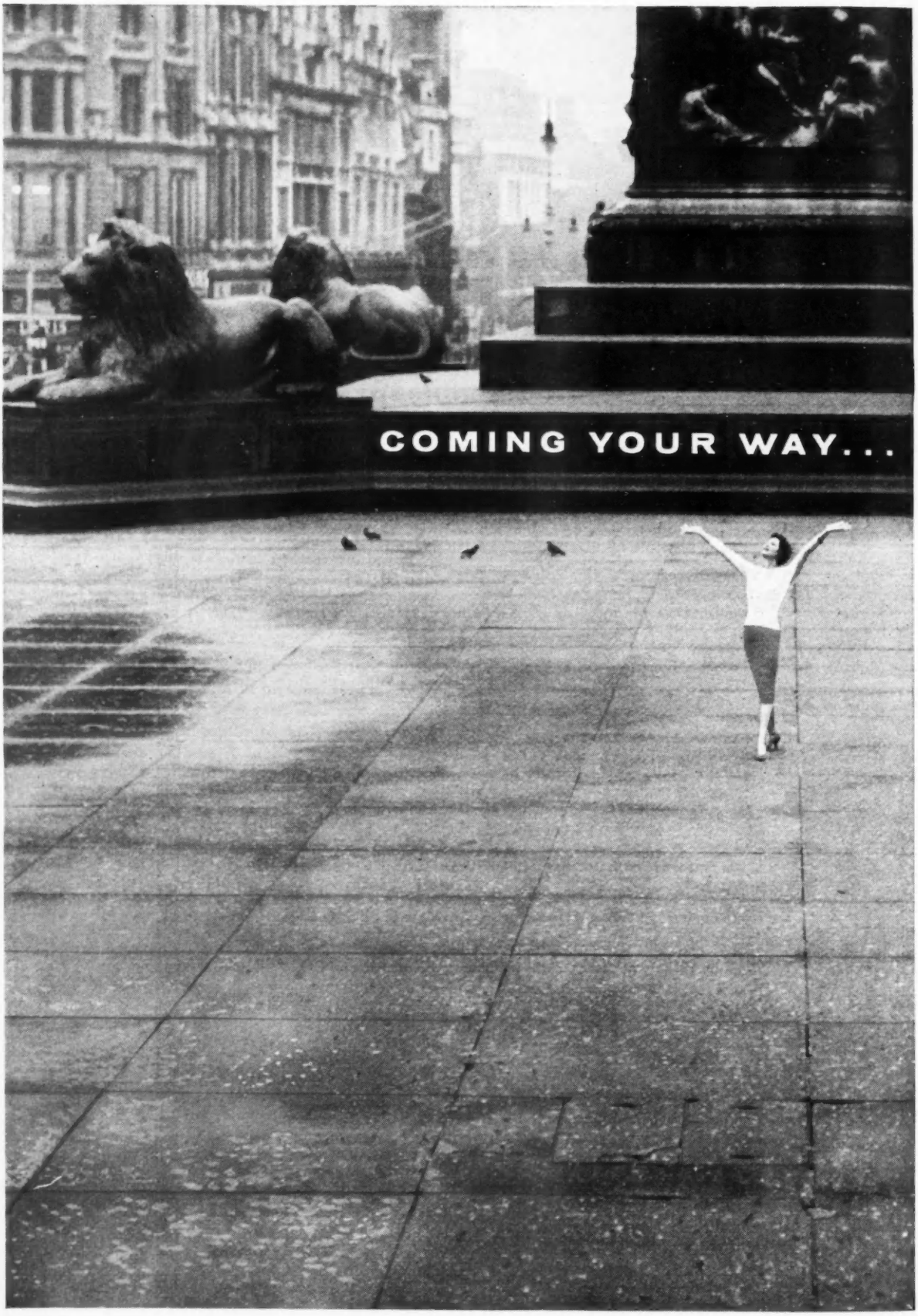
'Chamois' that never saw a goat;
jacket interlinings that never show a crease;
skirt stiffeners that always recover from wrinkles—
these are just a few of the non-woven fabrics
made possible by bonding fibres with HYCAR latex.
The recommended process is simpler than felting
and most economical in its use of fibre.
Any of the natural or synthetic fibres
—cotton, wool, nylon, rayon, acetate—can be
bonded separately or mixed.
To all of them HYCAR imparts excellent washability,
high tear strength and resistance to dry cleaning as well
as good crease resistance and wrinkle recovery.

There is a HYCAR latex for permanent warp sizing of yarns;
providing a full hand; reducing crocking;
binding pigment colours; ensuring crease and wrinkle resistance.
Full details of the properties and uses of
all grades of HYCAR latex are to be found in Booklet No. H2/147
Write for a free copy.

BRITISH GEON LIMITED

Sales and Technical Service
Devonshire House Piccadilly London W1
Hyde Park 7321

Hycar
Synthetic Rubbers


COMING YOUR WAY...

THE NEWEST MAN-MADE FIBRE

There's a brand-new acrylic fibre, Courtelle*, *now* being produced in Britain in commercial quantities. Clothes made from Courtelle are warm, soft and light, yet *completely* washable. This means new ease-of-care, new virtues, for clothes that used to be in the "daren't wash them" class.

A host of other man-made virtues, too, are built into Courtelle—virtues that will delight the wearer, and the maker-up, fabric manufacturer and knitter as well. Knitwear and fabrics in Courtelle will usher in a new era of hard-wearing, easy-upkeep *luxury*.

Soon, it will be coming your way.

Soon, people will be looking for this newest man-made fibre. There's a great future for everybody in Courtelle.

with all these built-in virtues

Warm Knitted or woven Courtelle not only feels warm; it keeps the wearer delightfully warm.

Soft Particularly in the High Bulk form which is recommended for knitwear, Courtelle gives a genuinely cashmere-like feel. And Courtelle suits the most delicate skin.

Light Warmth without weight is the distinguishing feature of Courtelle.

Strong Courtelle is about twice as strong as wool; and is very resistant to abrasion.

Stable Correctly made garments in Courtelle neither shrink nor stretch. This property is specially valuable in knitwear, which can be washed time after time without shrinking or felting.

Quick drying Clothes of Courtelle dry quickly.

Little or no ironing Knitwear is ready to wear as soon as it is dry: woven fabrics only need light pressing with a *cool* iron.

Creases drop out Clothes in Courtelle always look fresh and well-groomed, because creases simply fall out.

Mothproof Moths won't eat Courtelle, and it is not affected by mildew.

Impervious to chemicals Courtelle is particularly resistant to chemicals, and to alcohol and grease.

COURTELLE*

THE NEW ACRYLIC FIBRE BY COURTAULDS

adds luxury to living

"Courtelle" is the Registered Trade Mark for the acrylic fibre manufactured by Courtaulds Ltd., 16 St. Martin's-le-Grand, London, E.C.1

NOW... WHITIN PRESENT THE...

SUPER J COMBER*

NOTE THESE POINTS

- Higher Production
- Greater Nep Removal
- Unsurpassed Sliver Quality
- Lowest Maintenance and Operating Costs

CONSTRUCTION FEATURES

- 8 heads, single side
- Extremely precise construction
- 50% fewer parts than competitive combers
- New spring cushion plate, heavier detaching rolls and weighting, signal lights, lap run-out and knock-off motions
- Unique, simple detaching motion
- Bi-Coil or single sliver
- Unit assemblies

OPERATING FEATURES

- Production 40 lbs. per hour
- Speed 150 nips per minute
- Simple to operate
- Efficiency up to 97%
- Low production cost lb.
- Maintains settings between annual overhauls
- Simple setting, timing and waste control adjustments
- All heads set identically

Whitin

MACHINE WORKS
WHITINSVILLE, MASSACHUSETTS.

MACHINES BUILT IN EUROPE

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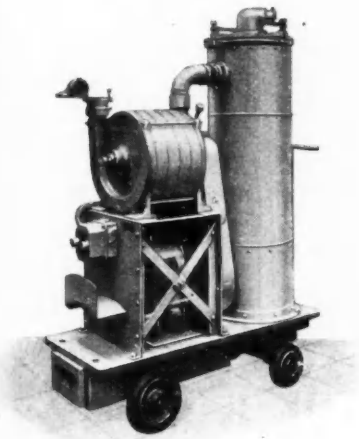
Cleaning...

Here —— There and Everywhere with

STURTEVANT INDUSTRIAL VACUUM CLEANERS

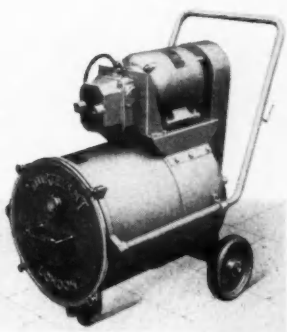
In every department of the mill there is urgent work for Sturtevant Portable Vacuum Cleaners —— removing dust and fly from every surface from ceiling to floor, and from machines in operation, thus reducing spoilage and increasing output.

For particulars of the full range of Sturtevant Portable Industrial Vacuum Cleaners **please write to our reference X/101/VC.**



No. 6X—Mounted on a truck of less width and length than standard for operating in mills where gangway space is particularly restricted

No. 5X—For use in congested areas where a compact machine with a vertical filter is preferred.



No. 5 MT—This machine is constructed for day-long cleaning of Automatic Looms, Healds, Tentering Machines and Selvedging Machines

STURTEVANT ENGINEERING COMPANY LIMITED

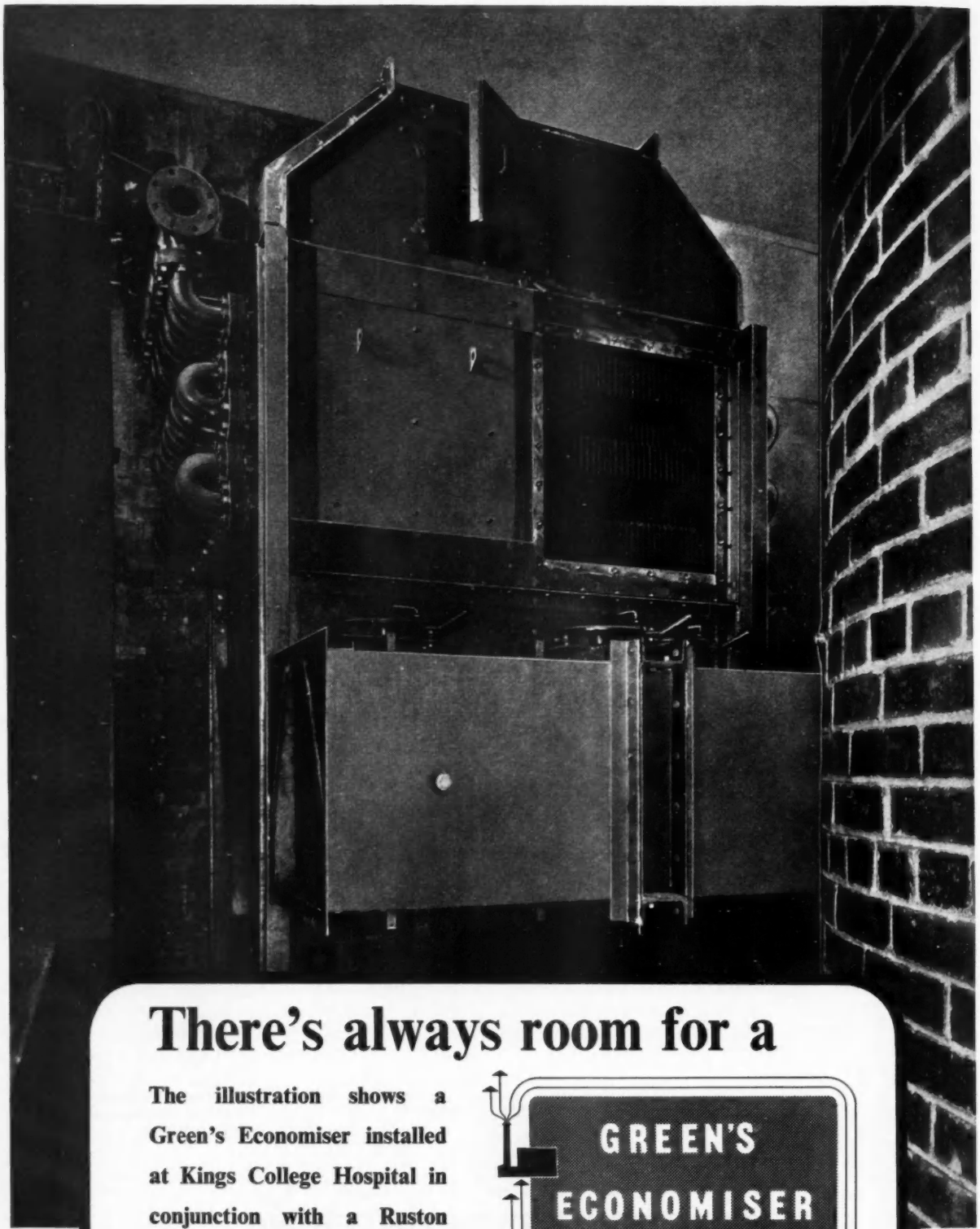
Southern House Cannon Street London E.C.4

ELECTROSTATIC PRECIPITATION

STURTEVANT INDUSTRIAL PLANT INCLUDES:

ELECTROSTATIC AIR FILTRATION · AIR CONDITIONING · DRYING · FANS
HEATING & VENTILATING · DUST COLLECTING · VACUUM CLEANERS

GRINDING & SEPARATION



There's always room for a

The illustration shows a Green's Economiser installed at Kings College Hospital in conjunction with a Ruston Thermax Boiler.

GREEN'S ECONOMISER

E. GREEN & SON LTD · WAKEFIELD

Makers of economisers for more than one hundred years

DUST SUPPRESSION

and fibre preconditioning by the

PUREMOR METHOD

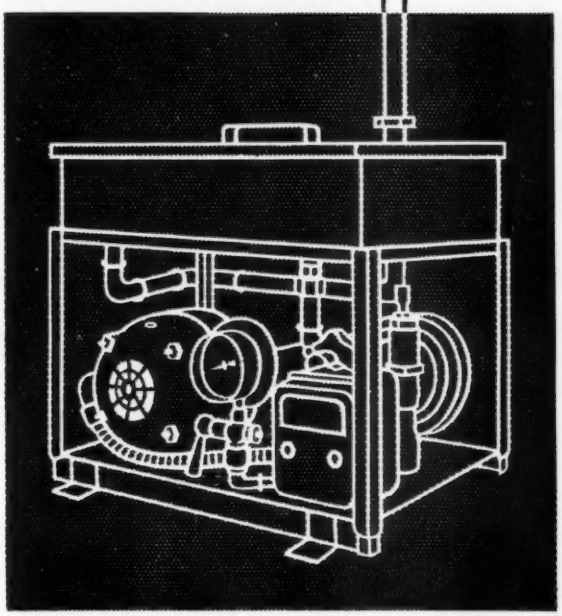
The PUREMOR Method has been so long established in a large number of mills as to warrant our confidence that our claims concerning its effectiveness are justified. These are—

CONTROL OF DUST

REDUCTION OF WASTE

AID TO PROCESSING

We also claim that our PUREMOR grades of oil are admirably suited to the preparation of WEAVING sizes and offer distinct advantages. We have many users who support these claims. Perhaps we can help in your Mill. If you will send us brief details of machinery used and a note of the type, grade and staple of fibre being processed we will bring our wide experience to bear on your problem.



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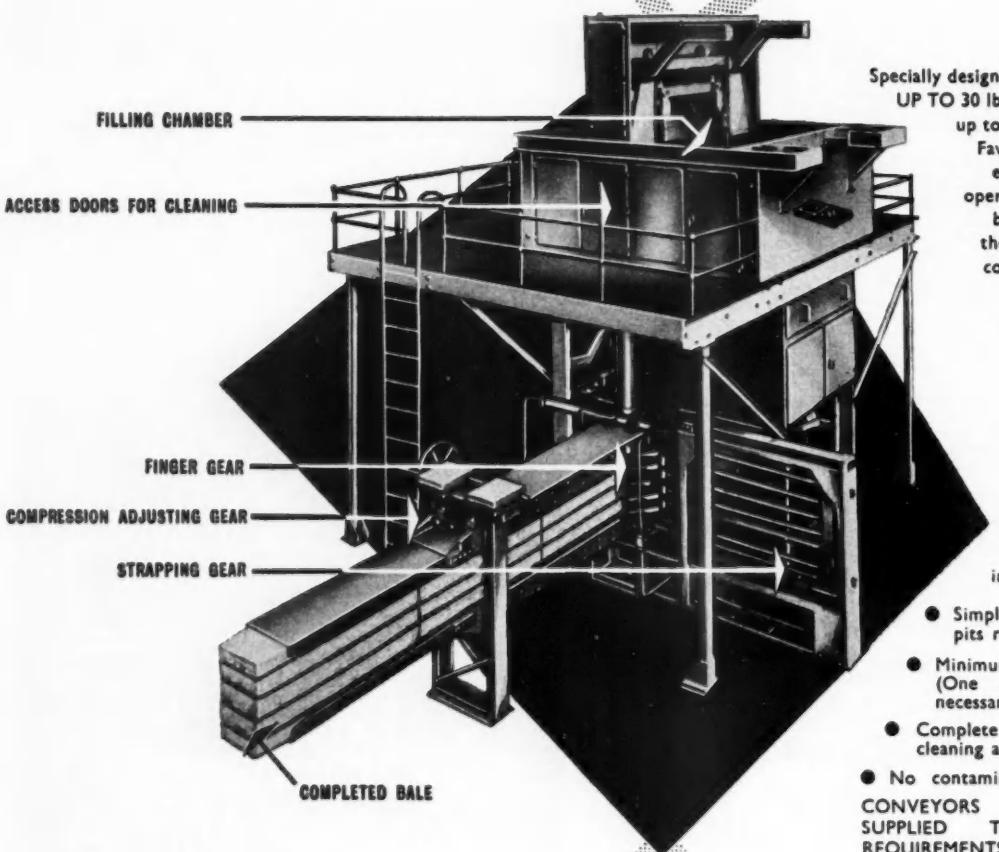
FAWCETT FINNEY LIMITED

PRESENT THE **FAWCETT**

HORIZONTAL SYNTHETIC

FIBRE BALING PRESS

FOR AUTOMATIC OPERATION



Specially designed to handle BALES UP TO 30 lbs/cu. ft. density and up to 400 lbs. weight, the Fawcett Baling Press is entirely automatic in operation with the fibre being delivered from the spinning lines by a conveyor and weigher direct to the trampling box. Full safety measures are incorporated throughout the full cycle of operation whether automatic or hand controlled. Outstanding advantages of the Fawcett Press include:—

- Simple installation. (No pits required)
- Minimum labour costs. (One operator only is necessary)
- Complete accessibility for cleaning and maintenance.
- No contamination of material.

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PRESS FRAME AND BOX OF ALL-STEEL 'COLCLAD' CONSTRUCTION
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HOPPER DOOR OF MILD STEEL 'COLCLAD' PLATE PNEUMATICALLY OPERATED & FITTED WITH HOOD
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AUTOMATIC SELF-STRAPPING OF BALE
INDIVIDUAL CONTROL OF EACH OPERATION

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for more than fifty years

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FRIAR PARK FOUNDRY, FRIAR PARK ROAD, WEDNESBURY, STAFFS

AP180-105

LOOM MOTORS

Mechanically interchangeable.
High starting torque.
Dust-proof.
Suitable for mounting on the loom frame or on a slide.
Terminals readily accessible.
Full details in Technical Description No. 347.

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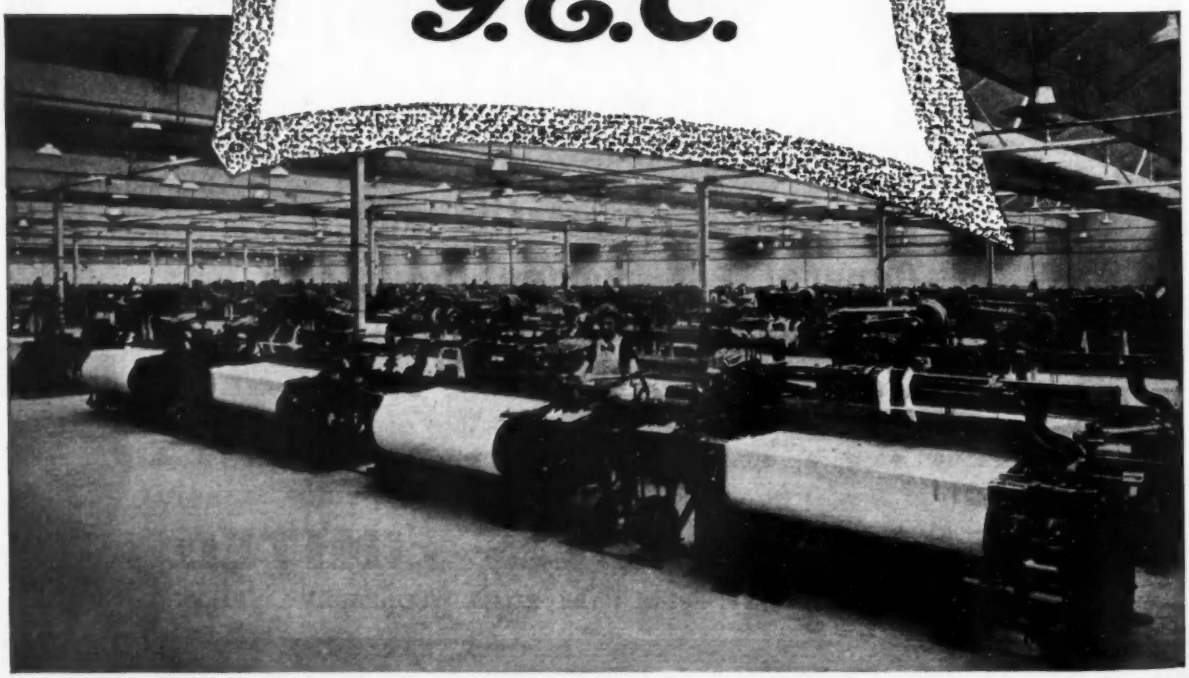
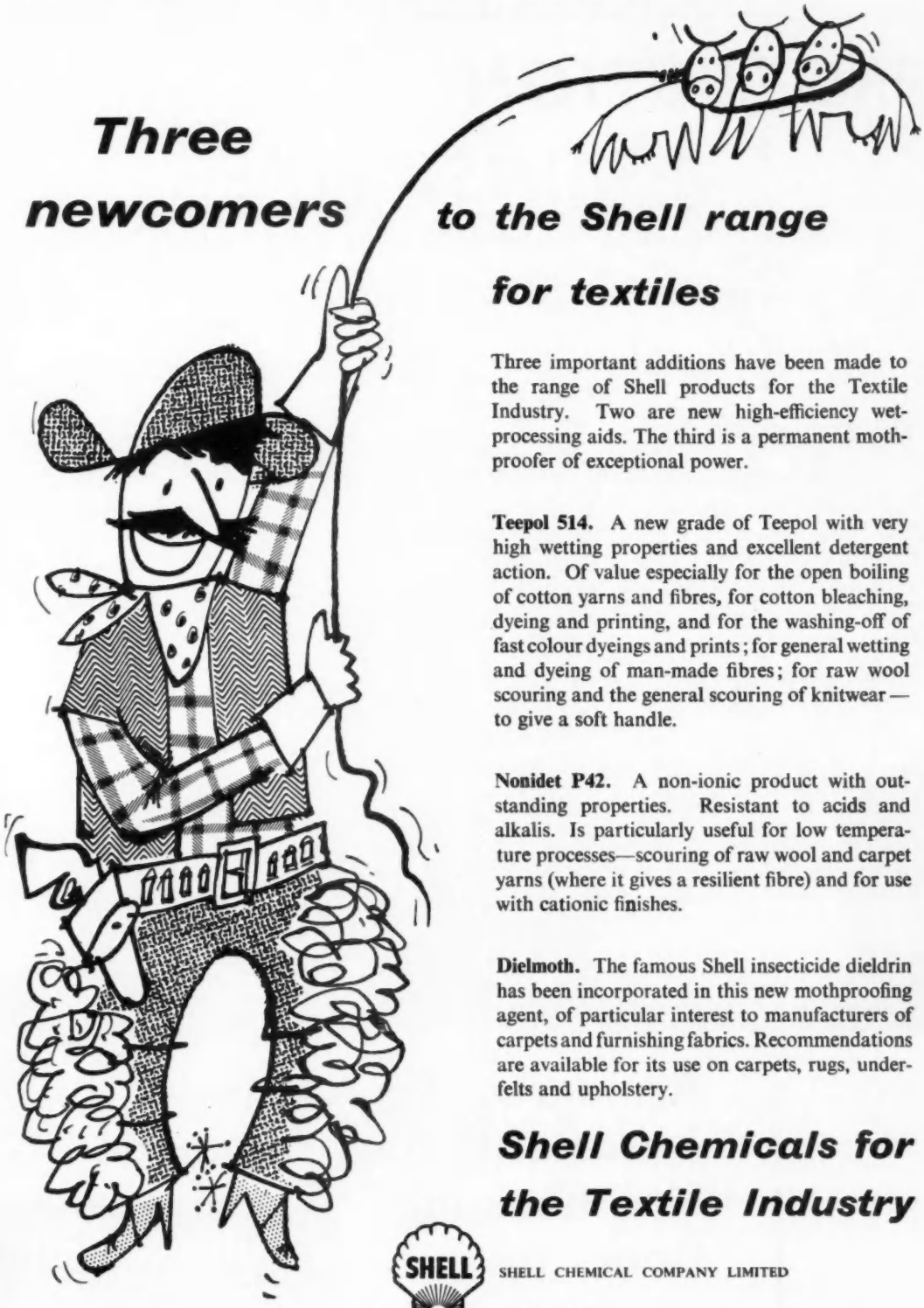


THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.

Three newcomers to the Shell range for textiles



Three important additions have been made to the range of Shell products for the Textile Industry. Two are new high-efficiency wet-processing aids. The third is a permanent moth-proofer of exceptional power.

Teepol 514. A new grade of Teepol with very high wetting properties and excellent detergent action. Of value especially for the open boiling of cotton yarns and fibres, for cotton bleaching, dyeing and printing, and for the washing-off of fast colour dyeings and prints; for general wetting and dyeing of man-made fibres; for raw wool scouring and the general scouring of knitwear — to give a soft handle.

Nonidet P42. A non-ionic product with outstanding properties. Resistant to acids and alkalis. Is particularly useful for low temperature processes—scouring of raw wool and carpet yarns (where it gives a resilient fibre) and for use with cationic finishes.

Dielmoth. The famous Shell insecticide dieldrin has been incorporated in this new mothproofing agent, of particular interest to manufacturers of carpets and furnishing fabrics. Recommendations are available for its use on carpets, rugs, underfelts and upholstery.

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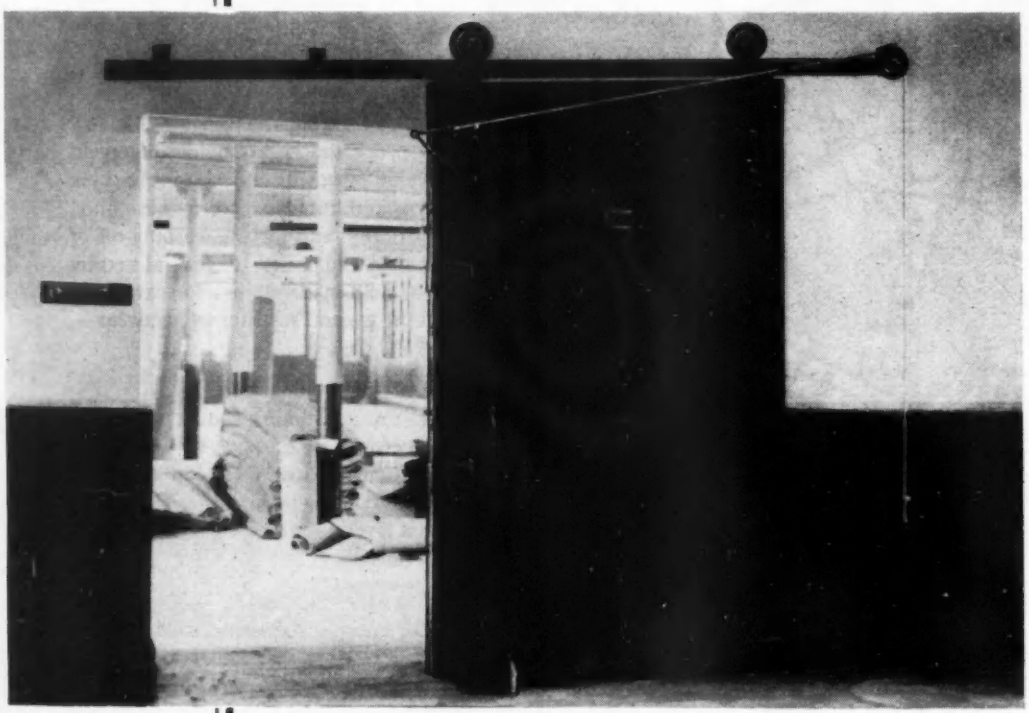
Mather & Platt have developed a variety of fire-doors to protect many types of building. Technicians are available to prepare schemes and make recommendations, without obligation, for all sizes of opening.



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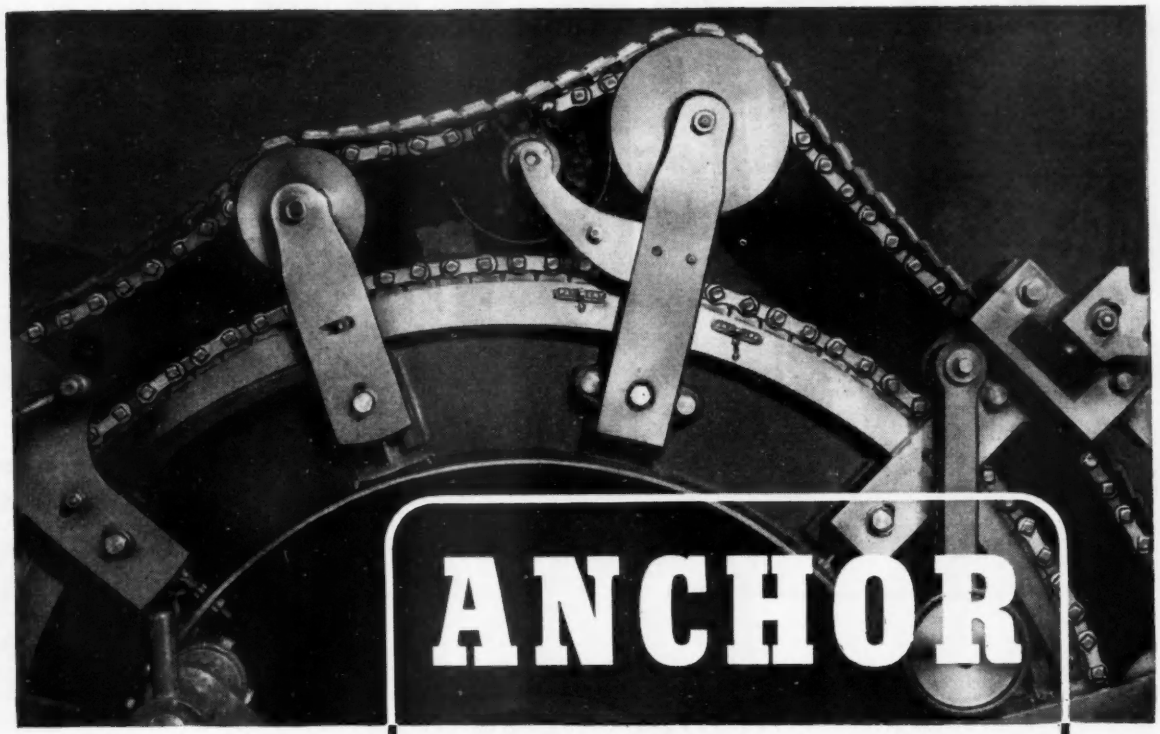

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FLAT CARD CHAINS

available FROM STOCK

A NEW SERVICE

Chains are now supplied boxed in pairs, for cleanliness of handling and storage. Right and left hand screws are also available, thus ensuring a 100% job.

ANCHOR CARD CHAINS ARE MANUFACTURED FROM HIGH QUALITY STEELS WHICH ENSURE LONG LIFE AND FREEDOM FROM BREAKDOWN. SIZES AND LENGTHS TO SUIT BRITISH, CONTINENTAL AND AMERICAN MACHINES.

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(Subsidiary of RENOLD CHAINS LIMITED)

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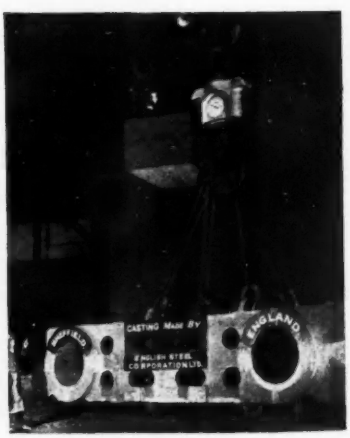
LARGE LOAD

. . . and the Belleville makes it possible . . . !

The largest capacity spring balance in the world. This instrument was made to weigh giant steel castings and is graduated up to 200 tons with 1 ton sub-divisions. It is approved by the Board of Trade for "Trade" purposes, where the requirement is that the machine must be accurate to within a quarter of its smallest sub-division.
Two Belleville washers, in this instance opposed to each other, supply the spring resistant. Their total movement under full load of 200 tons is never more than $\frac{1}{16}$ of an inch.



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...always a spring ahead!

★ When resistance to load or thrust is beyond the capacity of helical springs,

★ When take-up of shock or sustained load must be restricted to very slight movement,

★ When many tons of dead load must be sustained plus intermittent shock or live load . .

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Schärer wound pirns a real help to loom efficiency

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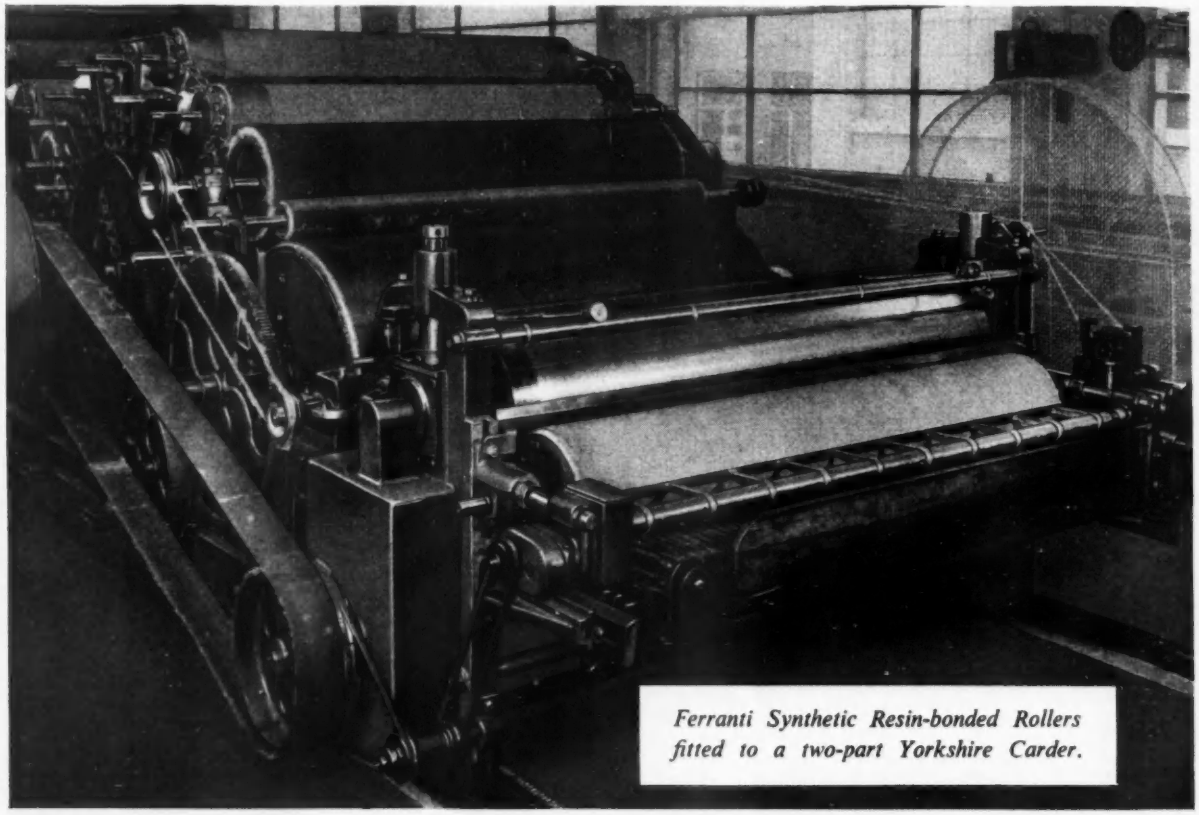


Ferranti Synthetic Resin-bonded Rollers fitted to a two-part Yorkshire Carder.

SYNTHETIC RESIN-BONDED CYLINDERS & ROLLERS FOR THE TEXTILE INDUSTRY

Typical Ferranti Resin-bonded rollers.

Ferranti resin-bonded cylinders for the textile industry have high strength to weight ratio — smooth surfaces — ready machinability — resistance to mild acids and alkalis. These properties are suited to a wide range of applications in the textile field, including preparatory machinery, bleaching, dyeing and finishing processes.

A wide range of resin-bonded tubes for packaging is also available. The great strength of these tubes has been used to advantage in the processing of continuous filament yarns where high crushing stresses are found.

Sizes from $\frac{3}{16}$ in. inside diameter to 6 ft. inside diameter are available with any specified wall thicknesses.

Send for list IDS.2 which describes the cylinders and rollers in full.

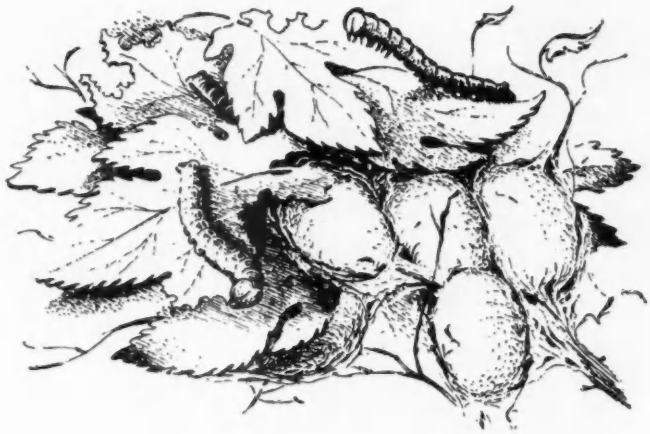
FERRANTI LTD

HOLLINWOOD • LANCS

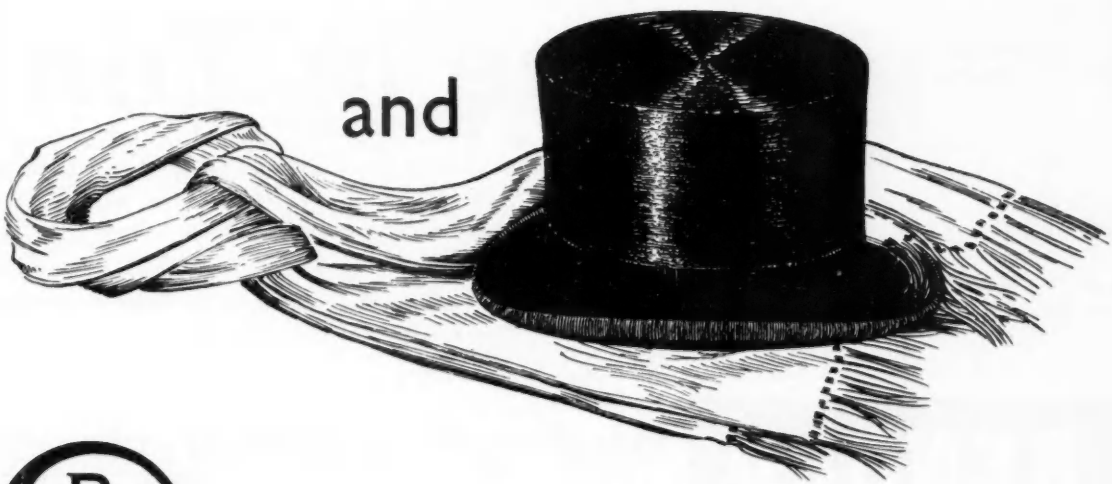
London Office: KERN HOUSE, 36 KINGSWAY, W.C.2

AT EVERY STAGE

between



and



B T-H

serves the Textile Industry

MOTOR DRIVES · ELECTRONIC CONTROLS
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BRITISH THOMSON-HOUSTON

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED · RUGBY · ENGLAND

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Stop Burning One in Ten!

Have a look at your power bill — and then consider your plant. Are you *sure* you are getting the most out of your transmission — or are inefficient drives frittering away the kilowatts which should be helping production?

As power costs increase efficiency matters more than ever — fit the only drive with a National Physical Laboratory Certificate confirming 98½% mechanical efficiency and get the power you pay for.

RENOLD high-efficiency drives cut your overheads

. . . Since 1947 electricity charges have almost doubled.
. . . Look at these figures from a typical factory :—

1947 £2·925 per 1,000 Units
1957 £4·9 per 1,000 Units

By making the most efficient use of power RENOLD CHAIN DRIVES are an effective counter to this cost spiral and can offset these and any future increases by as much as 10% — and go on doing so year after year.

RENOLD —*the FIRST name in precision chain*

RENOLD CHAINS LIMITED · MANCHESTER

This Plant Produces 2,000 lbs. Per Hour of Finely Dispersed Emulsion at 8 Parts Oil and 23 Parts Water.

Instantaneous Emulsification

MODERN PREPARING METHODS DESERVE AN AUTOMATIC EMULSION PLANT.

- The Fraser Rapisonic Emulsion Plant is Compact and Efficient, Continuously and Automatically Manufacturing Oil-in-Water Emulsions.
- Changes in Proportions of Oil or Water Immediately Effective.
- For Use with Jute Softener or Goods Spreader Machines.
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- Eliminates Human Error & Reduces Labour Costs.
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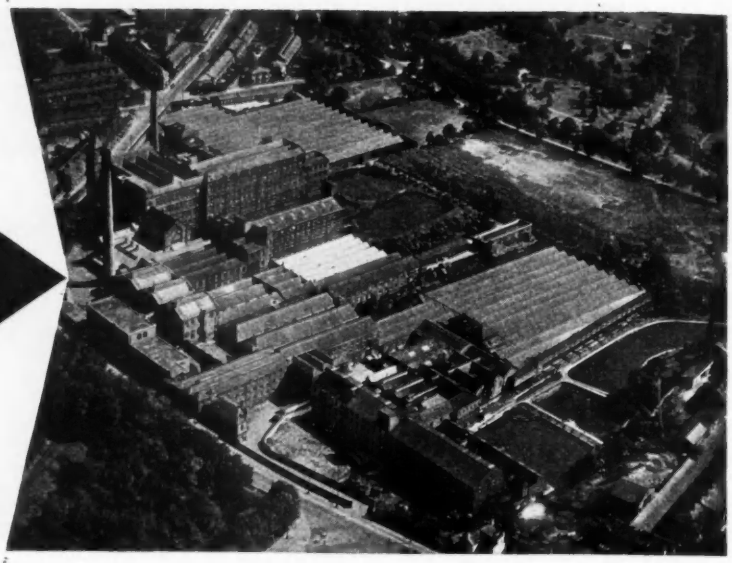
AIR CONDITIONING 'EVEREST'



From Messrs. Ashton Brothers & Co. Ltd. of Hyde, the famous makers of 'Everest' sheets and Industrial Fabrics, Sea Island Shirtings, 'Zorbit' towels and napkins, comes the following testimonial to Hank Air Conditioning Plant :—

" In our four weaving sheds equipped with central station Hall & Kay plants we have experienced significant increases in weaving shed efficiency, cleaner and brighter working conditions, and freedom from those cloth defects associated with direct injection of water or only partially controlled delivery of humidified air. In our view, well-designed air conditioning equipment is an essential pre-requisite to the installation of modern high capacity equipment . . . "

Hall & Kay Ltd

AIR CONDITIONING ENGINEERS

ASHTON-UNDER-LYNE, Lancs.

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is their Registered Trade Mark

and the use by others of the word

TUFNOL *in connection with*

products not made from material

supplied by Tufnol Ltd., is an

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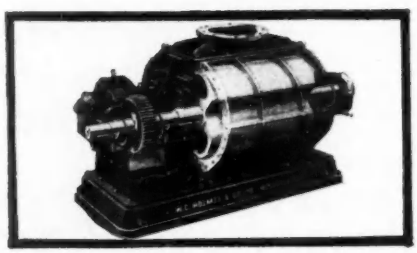
a long blow...

A long blow indeed! Holmes-Connersville Positive Air Blowers have been designed to give continuous (24 hours per day) trouble-free service and are consequently of extremely sturdy construction. This, combined with minimum maintenance and low running costs, makes them eminently suitable for a wide range of applications where air is required at pressures up to 10 lbs. per sq. inch. They are also suitable for low and medium vacuum conditions.

For full details please write for descriptive literature A/32



A cut-away view of an HI Type Blower

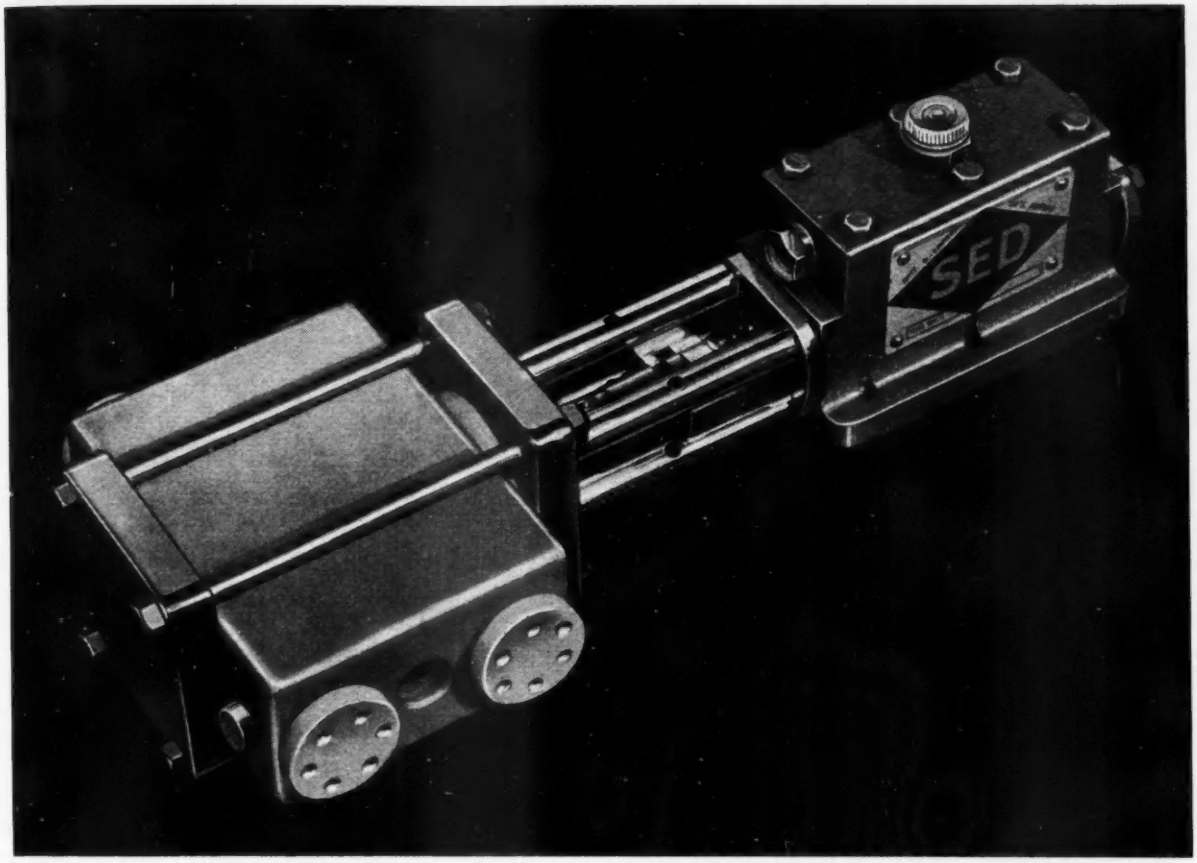
W. C. HOLMES & CO. LTD.

Gas Handling Division, Turnbridge, Huddersfield

Telephones: Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6880

C9057

'FLUON' *increases production in the Textile Industry-No.2*



Neumo Pump designed and manufactured by S.E.D. Engineering Co. Ltd., and marketed by Kingsbourne Products Ltd., Peacehaven, Sussex.

New corrosion-proof pump made from 'Fluon' polytetrafluoroethylene

A PUMP which is completely inert and gives positive displacement is of outstanding interest to engineers. This is the remarkable achievement of the Neumo 'Fluon' pump.

This pump can operate at pressures up to 40 p.s.i. and is connected in tandem with a piston type air motor which can be stalled without damage.

The liquid being pumped only comes into contact with 'Fluon', the cylinder piston and valves all being made from this fluorocarbon polymer which is only attacked by molten alkali metals and a few fluorine compounds at high temperature and pressure. This not only implies freedom from corrosion but also freedom from contamination.

Advantage is also taken of the very low coefficients of static and dynamic friction of 'Fluon' p.t.f.e. The moving parts require no lubrication and both wear and any tendency to seizing up are reduced to a minimum.

'Fluon' has a working temperature range of at least — 80°C. to + 250°C. and because few materials will stick to it, cleaning becomes a simple operation.

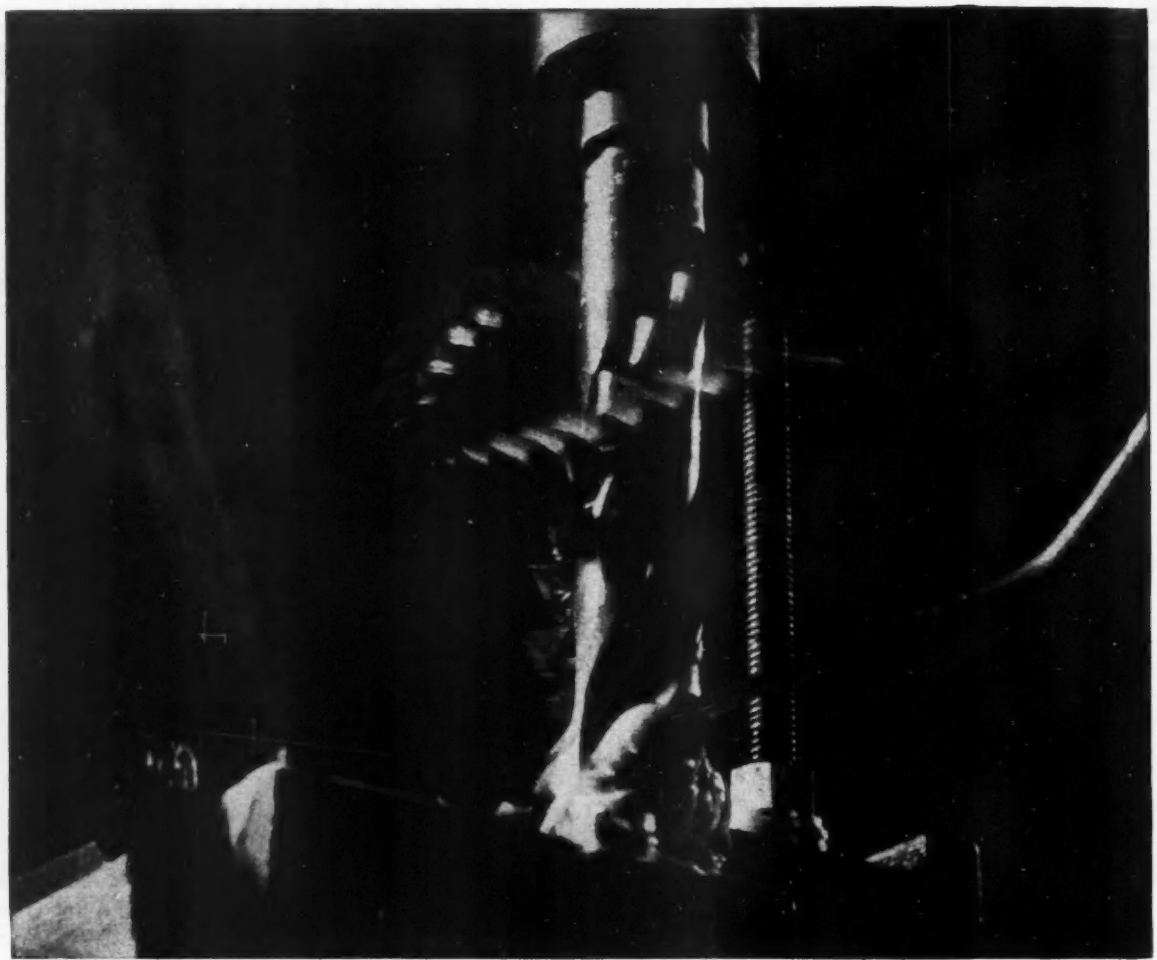
'FLUON'

'Fluon' is the registered trade mark for the polytetrafluoroethylene manufactured by I.C.I.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON · S.W.1

PF.35 T



There is danger here—danger to sight and limbs. But safety can so simply take the place of that danger. "Armourplate" glass shields give certain protection. And because the operator can see what is happening he works more confidently and efficiently. Accident rates drop, and production rises when "Armourplate" glass shields are fitted.

FOR SAFETY WITH VISION FIT

"ARMOURPLATE" GLASS

PILKINGTON BROTHERS LIMITED

Consult the Technical Sales and Service Department at St. Helens, Lancs. Telephone: St. Helens 4001
or Selwyn House, Cleveland Row, St. James's, London, S.W.1. Telephone: Whitehall 5672-6

"ARMOURPLATE" is a registered trade mark of Pilkington Brothers Limited. Supplies are available through the usual trade channels

SCHWEITER LTD

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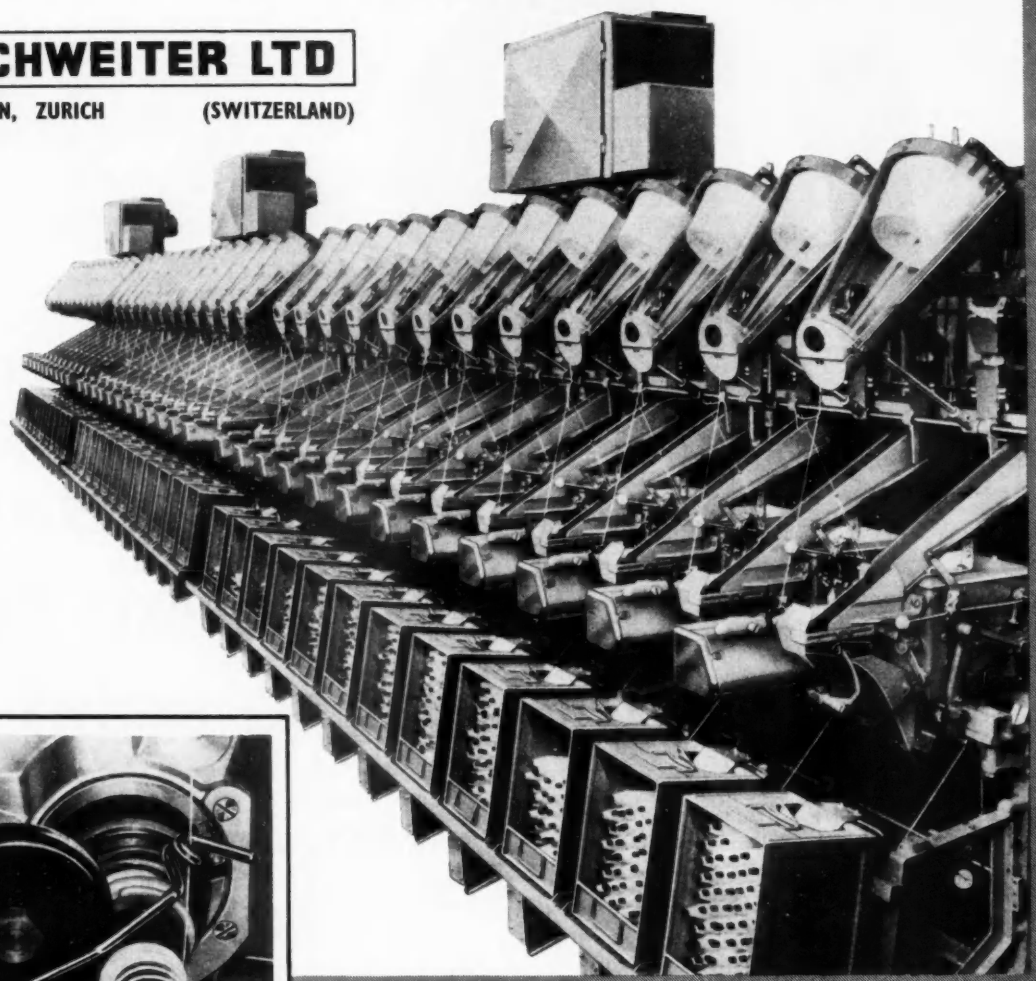
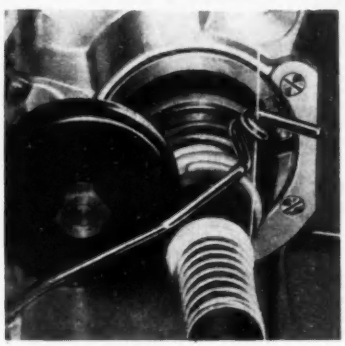
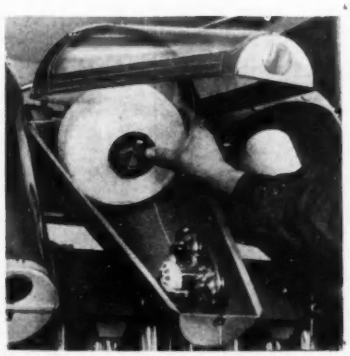




ROTOR Device for tailless pirns reduces labour when filling loom batteries



Suction hood takes all normal cross wound bobbins, also cheeses

PIRN WINDER TYPE MSL

This super automatic Pirn Winder is suitable for cotton, spun rayon, and wool, and provides the answer to many problems of increased production, improved quality, etc. Fitted with Automatic Pirn Feeding Device and the Schweiter 'Packer' Automatic Pirn Packing Device. Automatic Suction Dust Remover ensures clean pirns and reduced stoppages.

The ROTOR device for tailless pirns eliminates tail ends at beginning of pirns by covering them with normal winding.

Automatic Suction Dust Remover is a new and highly successful innovation. Keeps workrooms and machines clean and ensures an improved yarn quality.

Sole Representatives for the United Kingdom and Eire:

LIVESEY AND ASPINALL LTD.

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HEXAGON SOCKET CAP

AND SET SCREWS

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how to fasten

one thing to another,

get in touch with

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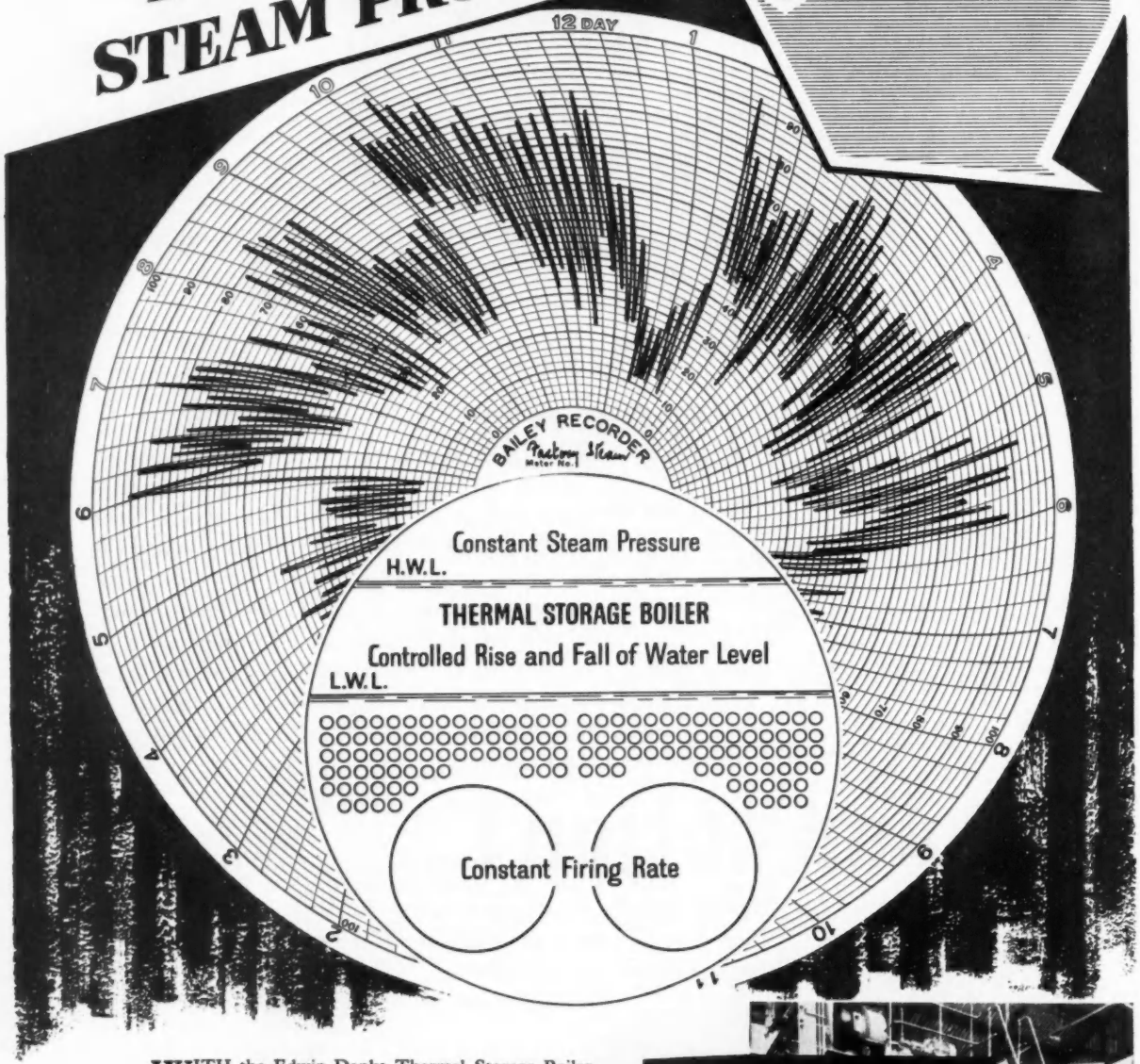

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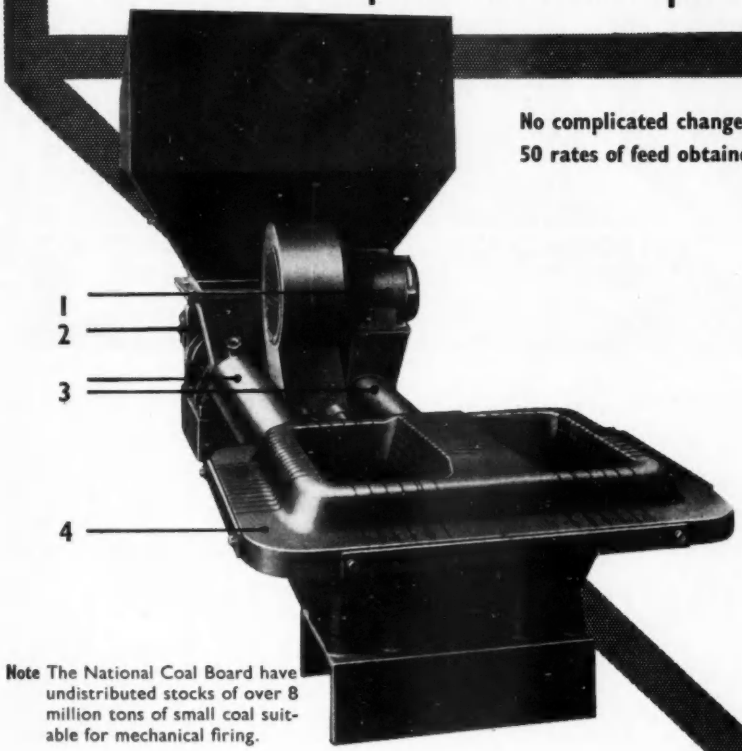

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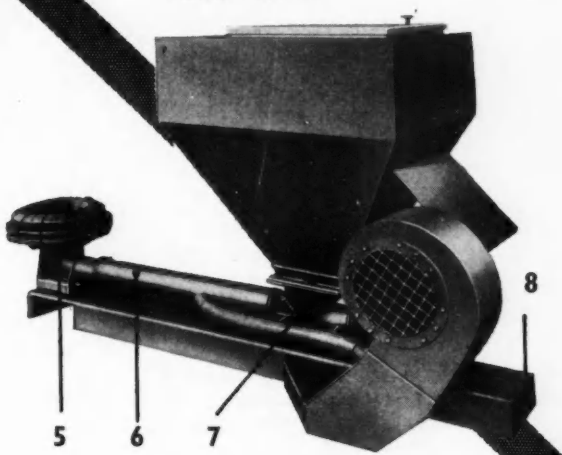

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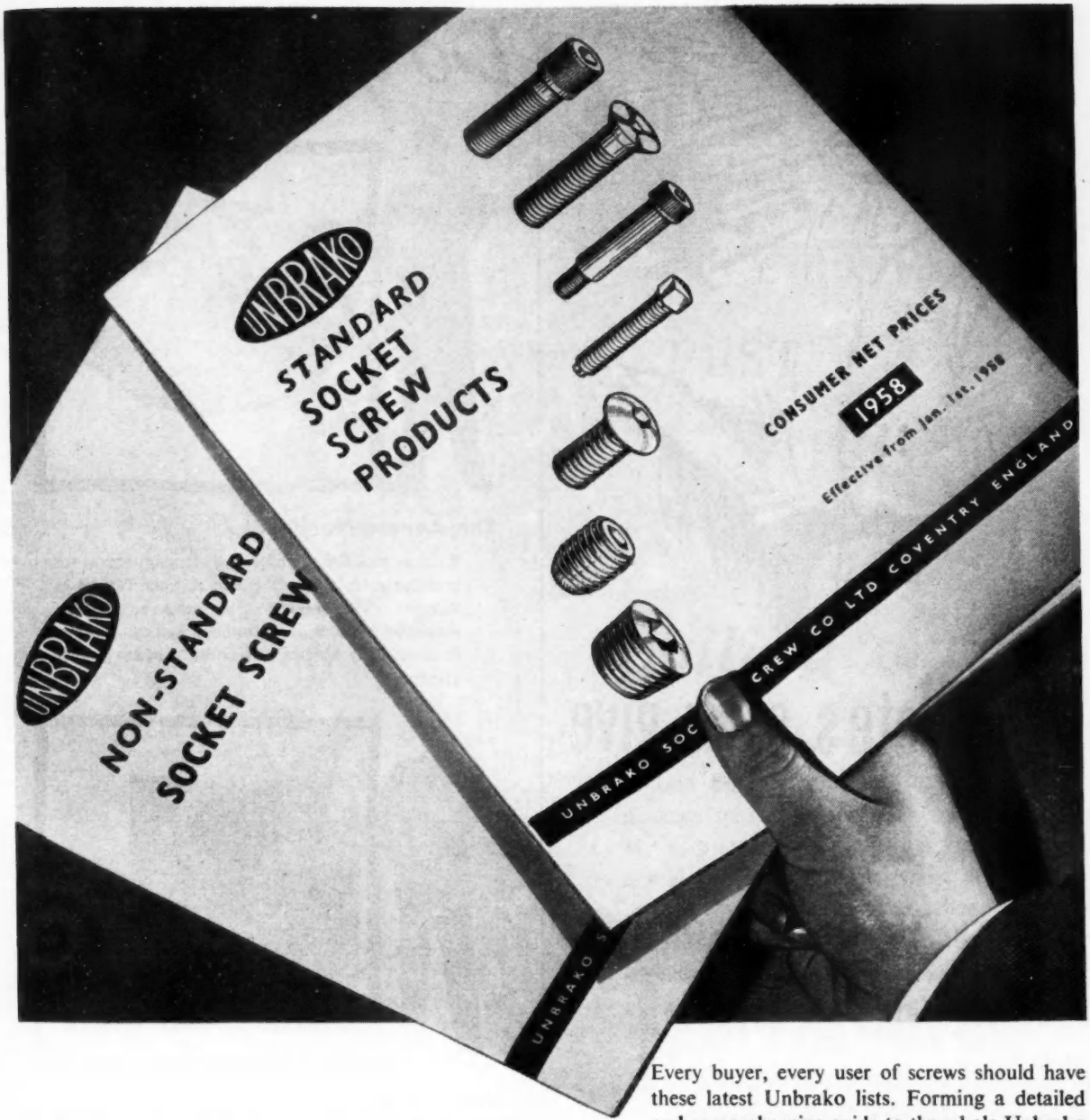

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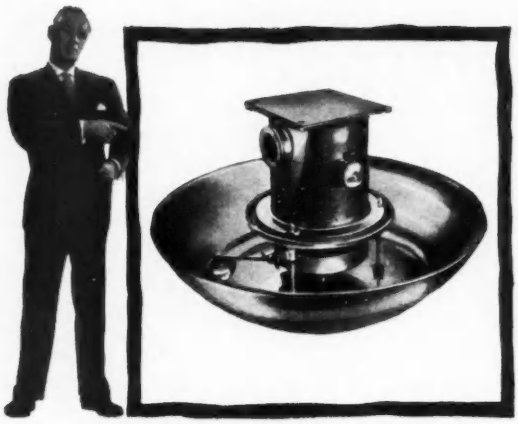

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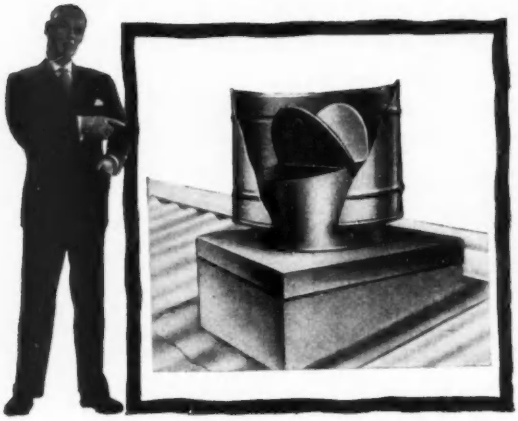

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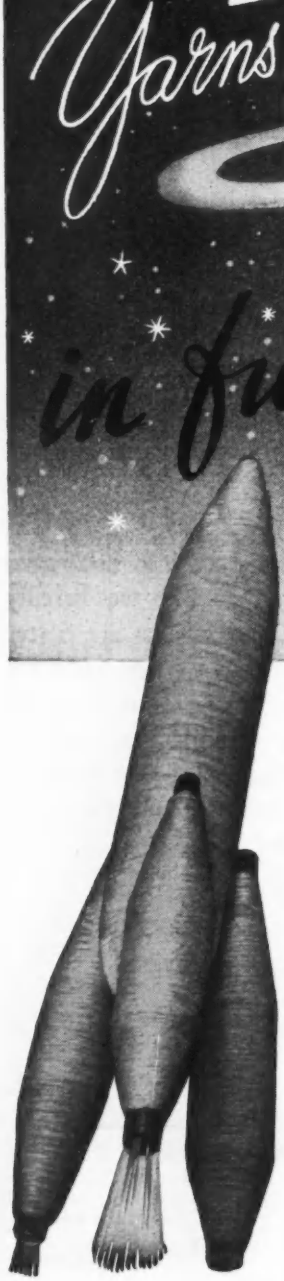

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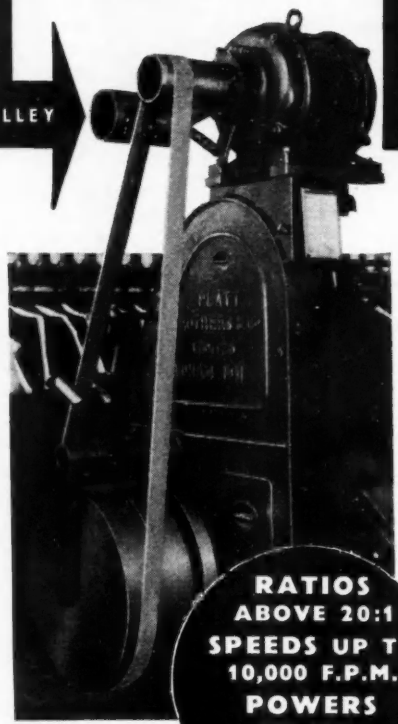

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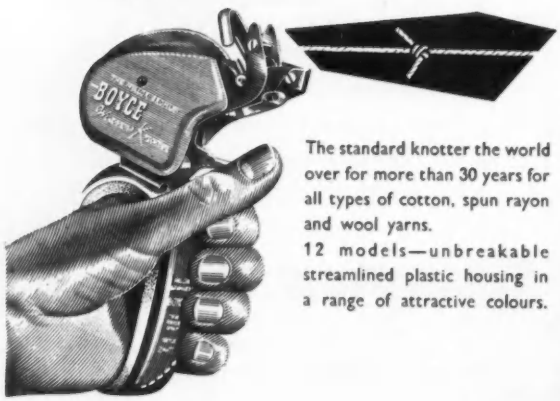

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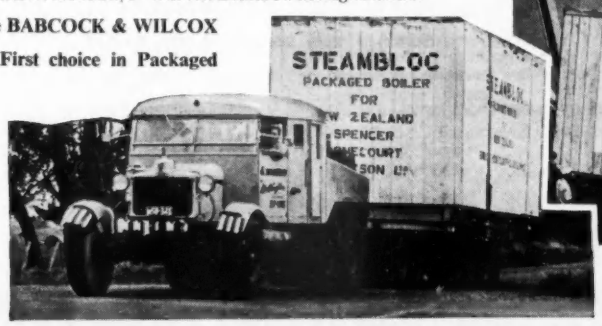

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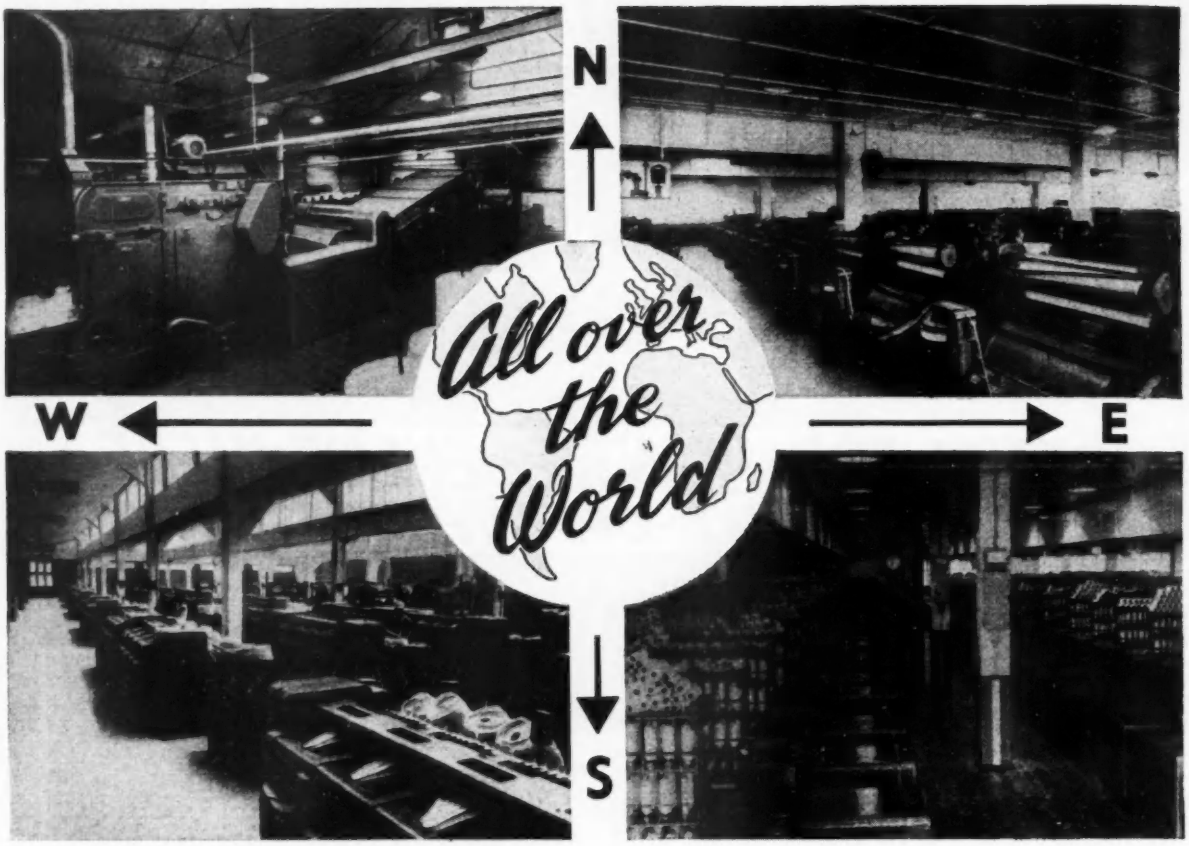

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THE TEXTILE MANUFACTURER

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Notes of the Month

TORRIDON MAY HAVE THE ANSWER TO "PILLING"

WORK now in progress at the Wool Industries Research Association in relation to the problem of "pilling" is now showing signs of interesting results. The object is to find a way of preventing knitted garments, such as cardigans and jerseys, from developing little balls of fibres on the surface, a nuisance known as pilling. Research began at Torridon with the examination of a large number of pills to see how they were formed. It was revealed that the fibres in the pills were not, as might be expected, mainly short and broken pieces. Then it was noticed that in nearly every case the little pill was anchored to the fabric by one or more long fibres. Evidently the pills were due to fibres creeping out of the fabric and then being rubbed into a ball.

Thus it was clear that in seeking a remedy the research workers must consider the whole fabric, not just the surface. Creeping of the fibres could be lessened by the use of harder twisted yarns and more tightly knitted fabric, but this would alter the character of the garment. Therefore another line of approach was required. Since an attack on the surface would be ineffective and there must be no tampering with the structure of the fabric, it was decided at Torridon to attack from the rear. The application of a very small amount of latex to the back of the fabric, it was discovered, would prevent fibres from creeping out. Remedies of this sort are always checked, in this case by an abrasion machine rubbing away on the laboratory bench at Torridon. In another practical test an experimental cardigan was worn for several weeks by a member of the staff. The under-side of one arm had been treated with latex, the other arm had not been treated. Both tests gave satisfactory confirmation that the formation of pills can to a large extent be prevented. These are preliminary results, and the research work is still in progress.

* * *

NON-WOVEN FABRICS

DURING her term as a member of the staff of the U.K. scientific mission in Washington, Mrs. P. A. Mars (economist, British Rayon Research Association) collected some information on the subject of non-woven fabrics. A 22-page report entitled "Non-woven (or Bonded) Fabrics and Synthetic Fibre Paper; Some Economic and Technological Developments in the U.S.A." has now been prepared and may be made available to British firms who have a bona fide interest in the subject at the discretion of the Department of Scientific and Industrial Research (or U.K. Scientific Mission) and of the directors of Textile Research Associations. Applications for copies should be made to the latter in the first instance. Despite scarcity of published information and difficulty of gaining access to manufacturing firms the report attempts to deal with both economic and technical aspects of the subjects.

It can be inferred from figures published by the Bureau of the Census in 1954 that in that year the new industry was sustaining close price competition from the traditional textile and paper industries. The average ex-factory cost of non-wovens made of cotton was $1·29 per lb. while those made of other fibres (excluding cotton waste) was 76 cents per lb. These prices were compared with the average of competing woven and knit fabrics, and paper which were 80 cents, $1·30 and 9 cents per lb. respectively. The woven materials included such constructions as filter cloth (76 cents), bandage cloth (79 cents) and industrial wiping fabric (56 cents). Knitted footwear lining cost $1·19 giving a better chance to non-wovens. The paper prices ranged from 4 cents per lb. for laminated wall board stock to 25 cents for filter paper.

The main reasons for the failure of non-wovens to compete on price in many cases are the high cost of resins used as bonding agents and the heavy expense of development and promotion when some 60 different markets are being entered at once. Owing to the extreme secrecy which prevails it is difficult to say whether much progress has been made in overcoming these obstacles since 1954. It is, however, claimed in some cases that non-woven products which formerly competed with ordinary textiles and paper on grounds of quality only are now able to compete on price as well. The volume of output is still believed to be low in relation to the total output of textiles. The report contains notes on the various products which are being made at present—especially the new synthetic fibre papers recently developed by du Pont—a summary of technical information and a bibliography of American sources.

* * *

EMSLEY LECTURE

COTTON acreage in the Belgian Congo covered approximately 900,000 acres, distributed in two large regions situated north and south of the Equator, Professor D. De Meulemeester, F.T.I., Chairman of the Scientific Committee of the Centre Scientifique et Technique de l'Industrie Textile Belge, told the Textile Institute in Manchester on the occasion of the annual Emsley lecture, at which Professor J. B. Speakman, D.Sc., F.R.I.C., F.T.I.(Hon.), F.S.D.C., Head of the Department of Textile Industries, Leeds University, presided. Two crops were obtained each year, said Professor Meulemeester, and this resulted in a more even flow of raw cotton to the spinning mills and as a result the avoidance of carrying large-scale stocks. A team of skilled agricultural research workers in Ghent (known as the "Manchester of the Continent") was available to give at short notice, advice on the main characteristics of cotton varieties and processing properties in the mill. The demand for Congo cottons far exceeded the supply, Professor Meulemeester observed. Discussing research developments, the speaker said that a

careful investigation of the fibre characteristics of the different cottons showed that the fibres of the abnormal varieties were more rigid than those of the other varieties and a high correlation was found between the number of neps included in the card web and the rigidity of the tested varieties.

Another point which had developed was the pernicious effect of the excess of yarn tension during the sizing process when the warp was still wet for it produced a decrease of the break elongation of the sized yarn and accordingly an increase of warp breaks during the weaving process. The use of batching emulsions for the spinning of raw material had also been evaluated. Research had been undertaken on an industrial scale in the university of Ghent. Some 48 tons of raw material had been treated with four batching emulsions and sent to mills each containing different spinning systems. The conclusion was that the care with which the lubricants were dispersed in water was one of the principal factors in obtaining good results in batching processing.

Concerning static electricity, relations between coefficients of friction conductivity and voltage generated by friction measured on rayon yarn by sensitive instruments were published recently. As a practical conclusion it must be mentioned that to avoid even small processing troubles with acetate yarn, the maximum voltage acquired by the yarn must not exceed 10 volts. Above 50 volts, processing was almost impossible.

Regarding tension the variation of tension of rayon yarn under a constant elongation was investigated with a modified Frenzel-Hahn apparatus. The regularity of tension was found to be a characteristic of the yarn and was not influenced by variations of count or of contraction. Attention was drawn to the importance of realising a high elongation modulus. Regarding friction using the well-known A. Buckle and Y. Pollett apparatus, it was found amongst other results that the gliding property of viscose or acetate rayon yarn did not increase when the percentage of soap or oil exceeded an optimum percentage.

* * *

BRITAIN MAINSTAY OF NEW ZEALAND WOOL MARKET

FROM the beginning of the New Zealand wool trade, the U.K. had been the largest importer of New Zealand wool and the mainstay of the New Zealand wool market, declared Mr. F. S. Arthur, manager of the London Agency of the New Zealand Wool Commission, speaking recently to members of the Bradford Textile Society. Last season, he said 44% of the clip was exported to the U.K., this being about the usual proportion; and the next largest importer was France, who took 19% last season and 17% the season before. Japan was not such an important factor in New Zealand as in Australia, and last season took about 2% of the clip, the same percentage going to Russia. A remarkable expansion in New Zealand wool production had taken place in recent years, he said, the increase since just before the war being roughly 50%—from 328 mill. lb. in 1938–39 to 487 mill. lb. in 1956–57. Since the war, the increase had been about 100 mill. lb. or roughly 33⅓% in 12 years. "The principal reason for this quite startling increase in production has undoubtedly been the payable prices obtained for their wool by growers," said Mr. Arthur. "This has provided the financial means, lacking during the lean pre-war years, for developing the land, breaking-in new land by mechanical scrub clearance and wholesale aerial top-dressing with fertiliser of previously inaccessible hill-sides, sowing improved pastures, rabbit clearance, etc. Given payable prices for wool and meat there is every reason to expect this annual increase of about 3% in wool production to continue for some years."

From time to time, he added, an extension of the selling season had been recommended, and it would be admitted that, in principle, an extended season must be in the best interests of orderly marketing although, in fact, a considerable extension had taken place since the war. This might be partly due to earlier shearing, but those charged with preparing the roster had adjusted it to suit changing conditions and increased quantities. Under present conditions it was not uncommon for growers who had shorn in January to have to wait until April or May to market clips and it was not a simple matter to suggest that they should wait even longer for the realisation of their wool. It would be a pity if an enforced extension of the season forced growers into private selling and thus undermined the auction system which was acknowledged the most satisfactory method of disposal for both sellers and buyers. Subject to the over-riding consideration of orderly marketing, the roster must be devised to effect reasonably speedy realisation of the clip. The committee responsible for arranging the sales had considered alternatives to the current roster, such as separate rosters for the North and South Islands. Such an arrangement would involve increased staffs, inflicting hardship on smaller firms, and it was difficult to see how separate rosters could result in anything but an acceleration of disposal rather than an extension of the season. Consideration was also being given to a system of three-day selling at certain centres. The committee's problems would increase with the growth of the clip, but it was a responsible and representative body, fully alive to its responsibilities to all the interests concerned, and the principles of orderly marketing would always be uppermost in the minds of its members.

* * *

NEW FACTORY FOR "COURTELLE"

CONSTRUCTION of the factory buildings at Grimsby for the large-scale production of Courtaulds new acrylic fibre "Courtelle" is nearly complete. It is on the same site on the Humber bank as the company's new "Fibro" factory. Installation of plant and machinery will begin shortly and production is expected to start early in 1959. Meanwhile, commercial quantities of "Courtelle" will continue to be produced at Coventry to meet the demand for this new, versatile fibre. The Grimsby plant will bring productive capacity for "Courtelle" to well over 10,000,000 lbs. per annum. It will be recalled that when Courtaulds acquired the Grimsby site in 1954 they announced that as well as containing the new "Fibro" factory, the site was large enough to allow for considerable expansion of the Company's activities. The new "Courtelle" project is the first phase of this development, and will require water for process purposes for which arrangements have already been made with the Grimsby, Cleethorpes and District Water Board.

Work on the site for the new "Courtelle" plant began only about the middle of last year. In spite of the necessity to pile for the foundations, the use of prefabricated components and modern construction techniques have made it possible to erect the factory buildings in a remarkably short time. The factory consists of sections for handling and preparing the raw materials, converting them into fibres, and baling the fibres for despatch to the textile industries. Road transport will be used for both the delivery of the main raw material for "Courtelle" and the distribution of the finished fibres.

Air Conditioning Installations—IV

In selecting plant for specific purposes initial cost is an important consideration but it is also important to remember that too much paring in this direction can easily lead to unsatisfactory and sometimes costly operation

By F. H. SLADE, A.M.I.MECH.E.

IN those cases where dehumidification is required, it is essential to estimate the full latent heat load; representing the heat to be extracted in a given time in order to condense sufficient water vapour to permit the air within the conditioned space being maintained at the required relative humidity. In so far as heat load from occupancy of a building is concerned, it will be found that the actual total heat given off by a person does not change greatly for varying dry-bulb temperatures, but the proportions of sensible and latent heat comprising the total heat change appreciably. Furthermore, the amount of sensible heat given off does not increase greatly for increased physical activity, but the latent heat or vapour given off is considerably increased.

Thus both sensible and latent heat loads from occupancy must be evaluated separately, and these assume increasing importance when resort is had to a by-pass recirculation system. Operating machinery, and processes, responsible for sensible and/or latent heat loads are of equal importance. They may also be responsible for heat load fluctuations. For example, in a weaving shed the largest single sensible heat load item would be the heat equivalent of the power supplied to the looms. Closing down of a number of the looms would result in a lessened heat production and call for a readjustment of environmental conditions. It is for this reason, amongst others, that automatic control of a plant is essential.

From the foregoing it is seen that internal latent heat gain is derived from occupants, leaky steam lines, or any other source which may bring water or water vapour into contact with entering air or with air that is in the conditioned space. Internal sensible heat gain is due to heat leakage through the structure of a building, occupancy, machinery and equipments and from the radiating surfaces of hot piping, etc. Heat loading also accrues from external sources through the fresh air brought into a building for ventilation purposes. This, as will be appreciated, is subject to constant variation throughout a single day and increases the need for complete automatic control.

For summer conditions the moisture content in most conditioned spaces is generally lower than the moisture content of the outside air. To illustrate this point carding of cotton can be taken as an example; the requirements here being a dry bulb temperature of 75°F. and a relative humidity of 50 per cent. It will be found that maximum summer environmental air conditions in this country are in the order of 85°F. dry bulb temperature, 72°F. wet bulb temperature, 66°F. dewpoint and 52 per cent. relative humidity.

In order that no shocks will be experienced when a person enters the conditioned space, the internal air should not be cooled to less than 75°F., or 10°F. below that of the temperature of the external air. Comfort conditions for any conditioned space are based upon "effective temperature," the definition of this term being that it is an arbitary rating of the joint effect of dry bulb and wet bulb temperatures; with an air motion of approximately 20 ft./min.

The effective temperature of 50° north latitude is 70°F., giving conditions of approximately 74°F. dry bulb and 60% R.H. to 76°F. dry bulb and 40% R.H. The dry bulb temperature is already set by the temperature difference between external and internal air at 75°F. Thus, the processing conditions of 75°F. dry bulb and 50% R.H. also coincide in this case with those required for human comfort. The characteristics of the internal air will be 75°F. dry bulb temperature and 62·5°F. wet bulb temperature, 55·4°F. dewpoint and 50% R.H.

It is already known that the air must be further cooled until it has been dehumidified, or until moisture has been condensed out of the air; to the extent of the quality, or moisture content, of the air under external conditions to that of the air under internal or conditioned space conditions. This for external air at 85°F. at 52% R.H. is 95·76 grains of saturated vapour per lb. of dry air, and for internal air at 75°F. and 50% R.H. = 75·30 grains of saturated vapour per lb. of dry air, or 95·76—75·30 = 20.46 grains of saturated vapour to be condensed out of the air per lb. of dry air circulated, or the fresh air entering the system must be cooled to the dewpoint of the air in the conditioned space, i.e. 55·4°F.

This air must then be heated by either mechanical means or by-pass air to the temperature required for delivery to the conditioned space; allowances being made for the sensible heat gained by the air inside the building. In actual practice, a proportion of the inside air will be recirculated and a proportion bypassed. The air passing through the conditioning plant will thus be a mixture of external and internal air. This means that in estimating the cooling load, allowances must be made for the sensible heat and latent heat gains of the re-circulated air and also of the by-pass air forming part of the final mixture delivered to the conditioned space.

External conditions in the winter, for design purposes, may be assumed to be 32°F. dry bulb temperature and 70% R.H. Many process stages, such as the storage and winding of acetate filament and acetate fibre rayon are carried out in environments in the order of 65°F. and 50% R.H. In the spinning rooms, however, it is customary to carry relative humidities of from 80 to 85% in order to slow down evaporation and to prevent sulphate crystallization on the fibres. As a dry

bulb temperature of around 70°F. is maintained in winter, the high relative humidity involves a high dewpoint.

In the first case quoted it is to be observed that the air in the conditioned space is to be maintained at 65°F. If outside air at 32°F. is heated up to 65°F. without the addition of any moisture it will produce only 20% R.H.; a condition adverse to processing requirements and also decidedly incompatible to operatives—causing dryness of the throat and skin and other detrimental effects. In a large plant the amount of water to be added to the air to humidify it may be from $\frac{1}{2}$ to $\frac{3}{4}$ tons per hour. For the quoted example 46·2—19·0 = 27·2 grains of water vapour must be added to the air for each pound of dry air circulated.

Taking advantage of the fact that heating air increases the capacity of the air to hold water, sufficient heat is added to the air to cause it, assuming 100% saturation efficiency, to become saturated at 46°F. is controlled automatically by adjustment of the heat to the heating coils, the quantity of moisture in the conditioned space will be fixed. A thermostat is fixed after the washer and set for 46°F. This controls the heat supply to the coil in the spray water tank, and to the preheater or tempering coil. As atmospheric conditions become colder the preheater is first brought into action. This warms the air, which in turn warms the water; then under extreme conditions of cold the tank coil is also brought into action. The saturated air at 46°F. leaving the washer is then heated up by the reheater to the temperature necessary to allow for equalising the room heat losses as it falls to the final condition of 65°F. These heat losses will vary with the outside temperature, according to the number of people, lights, type of plant, etc., in the conditioned space.

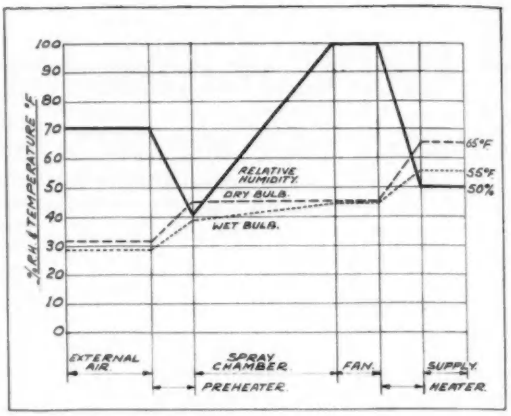


Fig. 31. Heating incoming air to the desired dewpoint temperature may, as shown, be effected at the preheater. Alternatively, the heat load may be proportioned between preheater and spray-heater.

A thermostat in the room is arranged to control the heat to the reheater, and thus maintain the correct dry bulb temperature under all conditions when heating is necessary.

Allowances

Even under these conditions allowances must, of course, be made for the latent heat gains, or losses, within the space, whilst a different set of conditions obtain if resort is had to recirculation, or a combined recirculation and by-pass system. With the latter, as previously indicated, sufficient fresh air is taken from the external course for ventilation only. This mixes with a certain percentage of the re-circulated air; having its dry bulb temperature and dewpoint raised as a result of the admixture. It then passes through the sprays, is heated and humidified, and then is mixed with the by-passed air after the scrubber plates and eliminators, whereby the dry bulb temperature of this air is raised as a result of the mixing. By this means the heating load is reduced throughout the entire cycle of operations.

The foregoing examples are illustrated graphically in Figs. 30 and 31, these diagrams showing the physical changes taking place in the air passing through the air-conditioning plant. From Fig. 30 read in conjunction with the abbreviated psychrometric chart shown in Fig. 32, it will be seen that point A in the latter figure indicates the initial state of the air and point B, the dewpoint temperature of that air. Thus sensible heat is absorbed from the air in the washer until it is saturated at 65°F. It is then further cooled to a dewpoint temperature of 55·4°F., during which process the air loses some of its moisture. At this state the air has a temperature of 55·4°F. and 100% R.H. Heating to point D, i.e. a dry bulb temperature of 75°F., gives the desired conditions of 75°F., dry bulb and 50% R.H. This example is not representative of general practice in air cooling, for the reason already stressed; that it is economical to recirculate some of the air or, in other cases, to by-pass some of the air round the air washer so that not all of it receives the effects of dehumidification.

The physical changes taking place during the processes of heating and humidification are also shown graphically in the abbreviated psychrometric chart, Fig. 33. This illustrates two sets of conditions. Firstly, as shown in Fig. 31, air at 32°F. is heated to 46°F., the dewpoint temperature of the final condition, without moisture change; represented by the horizontal line A–B. Next the air is saturated without change of temperature and its condition after saturation is given by point C on the saturation curve. Its dry bulb temperature is then raised to 65°F. in passing through the afterheater, giving, as shown by line C–D, the desired condition of 65°F. dry bulb and 50% R.H.

The alternative, or second, set of

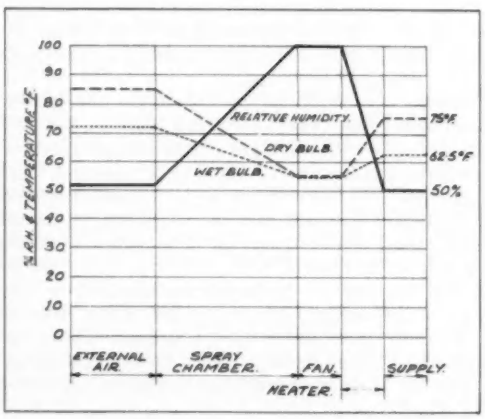


Fig. 30. Physical changes taking place in air passing through air conditioning plant during cooling and dehumidification

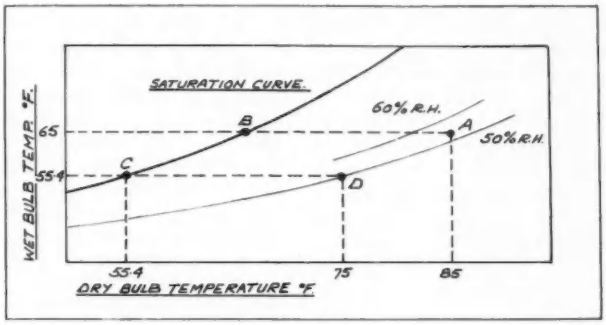


Fig. 32. Abbreviated psychrometric chart illustrates the effect of cooling to a dewpoint temperature of 55·4°F. and subsequent re-heating to a dry bulb temperature of 75°F.

processing conditions would provide for pre-heating, and subsequent heating to the dewpoint temperature of the desired final condition within the spray chamber. The heating load would then be divided between the preheater and the spray heating coil. To comply with these requirements, the temperature of the incoming air would be raised from 32°F. to say, 40°F. (line A–E) without change of moisture content, and saturated at this temperature (line E–F). Both heat and moisture are then added to the air stream (line F–C) in the spray chamber; raising the dewpoint temperature of the air from 40°F. to 46°F. The procedure onwards, to complete the process, follows that previously given.

Temperature and Humidity Control

Before briefly considering this very important subject, it should be stressed that there is no air-conditioning system standard to all applications, every particular process needing a varying design of air conditioning plant and, in consequence, a control system to suit both plant and process. This applies to the plant for process work and plant for process workers. In a plant for general purposes it will be found that control of three main points are inserted, i.e. (*a*) the space being conditioned, (*b*) the space wherein the air is to be delivered and (*c*) the source whereby the temperature variations are effected. The control of each of these is interlocked in such a manner that the co-ordination of the functions of the whole plant is possible. Control of the space to be conditioned is, of course, the most important consideration. It is, in effect, the master control. This can be effected by either one of three methods. These are:—

(1) Individual control.
(2) Single thermostat control.
(3) Zone control.

Individual control, as the name implies, is where each room in a building is individually controlled by controllers within that room, or in the case of a large room, by more than one controller, in order that a proper measure of the conditions within that space is obtained. This method of control is the most accurate and flexible means of regulating temperature and hygrometric conditions.

Single thermostat control is used when constant conditions are required in any given number of rooms serviced by a central plant. One room is chosen as an index room and the controller is located in this; determining the conditions throughout all the other rooms. As can be understood, differences in control are to be expected from this method, for to obtain a perfect balance between all rooms controlled by one set of controllers is a very difficult problem. Zone control is usually applied to very large spaces. The space is split up into areas or zones, each zone being provided with its own set of controllers which function to regulate the conditions within that particular zone.

According to the design of the equipment, valves controlling heat or water supply to the air conditioning installation, or dampers placed at suitable points in the conditioned air circuit, are actuated automatically. This is effected by impulses transmitted electrically, hydraulically, or pneumatically from thermostats and hygrostats suitably placed and responsive to changes in dry bulb temperature or relative humidity respectively.

Pneumatic operation is effected either by positive air pressure or vacuum pressure. The requisite pressure is maintained in the pipe line connecting the controlling instrument and the valve it actuates by means of a small compressor or exhauster. Pressure changes in the pipe line occur as the result of air leakage permitted by the thermostat or hygrostat as such instruments respond to temperature variations. These changes in pressure operate the control valve, or damper,

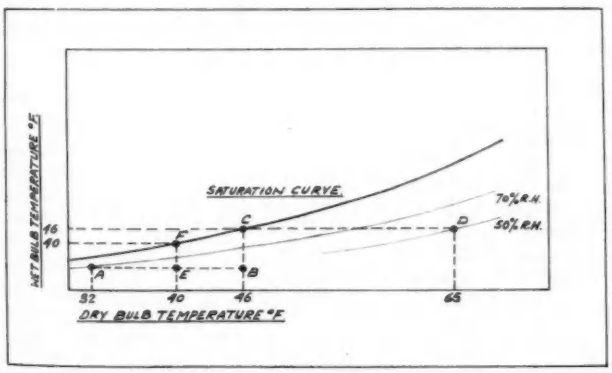


Fig. 33. Line A - B illustrates the effect of pre-heating from 32°F. to 46°F. followed by adiabatic saturation within the washer, and re-heat (C - D) to a dry bulb temperature of 65°F.

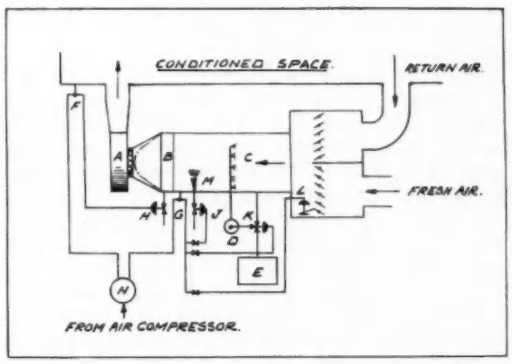


Fig. 34. Compressed air operation of instruments effecting dewpoint and temperature regulation is a design feature of this control system

by means of a diaphragm or spring mechanism.

Control of humidification in Sirocco plant, for example, is usually effected by one of two methods; such as were indicated in Fig. 33. The first of these applies to those cases where the amount of water vapour in the air is comparatively small. Here the heat required for evaporation of the spray water may be provided by the pre-heater, whilst the heating effect is controlled by a thermostat placed at the discharge end of the air washer and responsive to dewpoint temperature. Any tendency of this temperature to change, resulting from external changes causes the preheat to be suitably varied, thus restoring the dewpoint temperature to the prescribed value.

The second method is employed where a large degree of water humidification is required. Then it is usual to arrange that the thermostat placed at the discharge end of the air washer controls a three-way water mixing valve in addition to or instead of, the valve in the steam supply line to the preheater. With this arrangement spray water is taken from two sources. One of these is a warmed supply, the water being heated by an ejector type steam heater or by an external calorifier; the second supply is taken from the tank at the base of the air washer, into which water is returned from the atomising sprays. The two supplies are mixed according to requirements by the mixing valve, the combined feed to the atomising sprays being at such temperature as to maintain dew-point temperature as desired.

When an air-conditioning plant is required to effect cooling and dehumidification, the moisture content, or dewpoint temperature of the air discharged from the washer is held constant in a similiar manner. Air preheating is not required, but the thermostat placed in the chilled air stream controls, as before, a three-way water mixing valve. Water is taken from two sources, one of these being a refrigerated water supply, while the other is the somewhat warmer water contained in the tank below the spray nozzles. These are mixed in suitable proportions, the resultant supply being fed by the circulating pump to the atomising sprays.

Control of dry bulb temperature within the conditioned space is usually effected by control of the main, or after, heater; supplemented by the control of booster heaters in large buildings. This is effected by either one of the three control methods previously mentioned. Where resort is had to the by-pass system the circulated air is divided into two streams, one of which passes through, and the other around the air conditioning plant. The relative volumes of the two streams are varied as required by means of dampers responsive to automatic control.

Fig. 34 illustrates diagrammatically automatic controls applied to a Sturtevant full air conditioning system. In this the main relative components are (A) fan, (B) air heater, (C) air washer, (D) pump, (E) chilled water, (F) thermostat (room temperature), (G) thermostat (dewpoint), (H and J) steam control valves, (K) mixing valve, (L) air lever motor, (M) steam ejector water heater and (N) compressed air receiver.

Under conditions calling for heating and humidification, the system operates in such a manner that humidity control is effected by thermostat G controlling the pressure of compressed air passing (1) to air lever motor L which operates dampers to proportion the fresh and return air entering the system and (2) the diaphragm valve J which controls the flow of steam to ejector M in the washer tank. During this process compressed air is isolated from mixing valve K which thus passes re-circulated water only to the pump D.

When the plant is used for the purposes of cooling and dehumidification the dewpoint temperature is controlled by thermostat G controlling the pressure of compressed air passing to the mixing valve K, to proportion the chilled and re-circulated water entering the pump. The air lever motor L and diaphragm valve J are isolated, and the louvred dampers are set manually to admit fixed proportions of fresh and return air. In each case, the dry bulb temperature is maintained by compressed air to diaphragm valve H which regulates the flow of steam to air heater B.

The control system illustrated in Fig. 35 provides for automatic change-over from the cooling to heating cycles. During the heating cycle the required temperature conditions within the space being conditioned are maintained by thermostat T_1, which operates modulating valve V_1 controlling the heating medium to the heating coils. Hygrometric conditions are controlled by hygrostat H_1 which operates control valve V_2, admitting water to the sprays whenever humidification is necessary; low-limit control is obtained by thermostat T_3, which operates valve V_1 whenever the temperature falls below that which is required.

During the cooling cycle thermostat T_2, functions to operate modulating valve V_3 controlling the flow of coolant to the cooling coils. Hygrometric conditions are controlled by hygrostat H_2, which operates valve V_3 whenever the relative humidity exceeds a predetermined amount. Thermostat T_3 may also be arranged to act as a low limit during the cooling cycle if the conditions of the installation make it desirable.

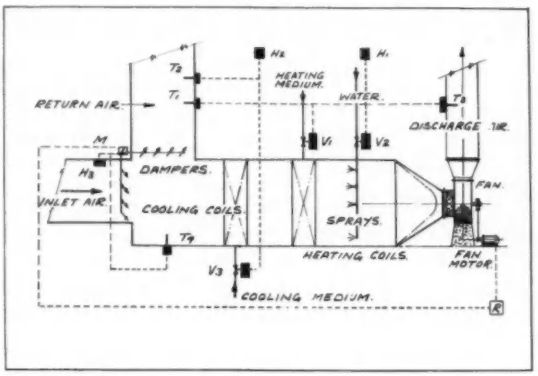


Fig. 35. Control system for plant incorporating heat transfer surface coils for air cooling and heating

Thermostat T_4, installed in the inlet to the conditioner control damper motor M, which in turn regulates the relative quantity of outdoor and return air admitted to the system. This damper action may be provided with a minimum setting of the outdoor damper so that a minimum fixed requirement of outdoor air will be ensured for ventilating purposes. Humidity control H_3 measures the outdoor air relative humidity and prevents the outdoor air damper from opening beyond its minimum position whenever the outside air relative humidity exceeds the set point.

The damper motor M is also actuated by relay R, which is controlled through the fan motor. Cessation of fan

operation will operate relay R, to activate damper motor M and close the dampers illustrated in the diagram. It should be observed that this system demands that thermostat T_1 is set at a lower temperature than T_2, in order that each may assume command upon the fall or rise respectively of the temperature of the return air.

Very close control is afforded by the system now illustrated in Fig. 36; installed by the American counterpart of Honeywell-Brown Ltd. Although not used in a textile factory, the system is applicable to projects where fine temperature and humidity regulation is imperative. In this particular case a dust-free atmosphere was a design feature and thus, to prevent relatively dust-laden outside air from seeping into the factory building, the air conditioning equipments maintain an indoor pressure slightly above barometric pressure. Furthermore, since it is more economical, two separately conditioned areas are maintained. One area, comprising the periphery of the building, houses certain manufacturing areas which require especially rigid control of air conditions. The other, comprising a large central area of the building, constitutes the main manufacturing area.

In the periphery, air conditioning is controlled both manually and automatically. The four air conditioning units serving the periphery are located in the truss space between the ceiling of the manufacturing areas and the roof. This space constitutes a plenum chamber. The four units operate a total of 82 non-circulating diffusers. They also incorporate an unusual double-duct system which carries both warm and chilled air to each diffuser. The temperature of this air is regulated by two submaster thermostats which are manually set. The diffuser discharge air temperature is automatically regulated by a pneumatically operated damper regulated by a zone controller. The damper is designed to vary the relative amounts of hot and chilled air without affecting the total quantity.

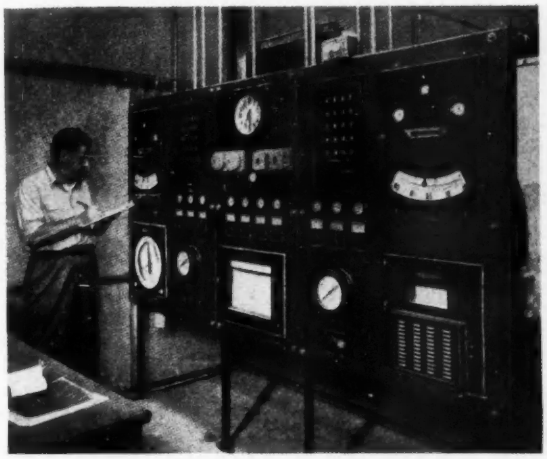


Fig. 37. Master control. The indication and recording of the air conditioning system operation are provided by the various instruments mounted on the panels

The main floor manufacturing area is served by six units also located in the plenum chamber. These units operate diffusers throughout the main manufacturing area. Operation of these units is as shown diagrammatically in Fig. 36, in which A denotes winter humidistat, B controller in individual zone, C summer humidistat, D diverting relay, E thermostat, (1, 2, 3 and 6) pneumatically-operated modulating steam valves, and (4 and 5) pneumatically-operated modulating cooling water valves. The diffusers provide discharge air into the manufacturing area from their periphery; as shown. Return air is drawn in through the centre of the diffuser and returned to the plenum chamber.

The total amount of air taken into the building is determined by (*a*) the amount of process exhaust to be replaced; (*b*) the amount needed to maintain the positive indoor pressure; and (*c*) the condition of the outdoor air. All air taken into the building passes through dry type filters. The amount of air needed to maintain the requisite indoor pressure is controlled by indicating differential pressure controllers which pneumatically operate dampers on the fresh air intakes of the air conditioning units. Winter and summer a wet and dry bulb differential recorder-controller compares the outside and inside temperatures and, in effect, determines whether it is more economical to admit fresh air into the building or to cool the air already inside. In operation, the controller actually pneumatically positions the intake and recirculation dampers in accordance with prevailing conditions.

An out-of-doors master thermostat controls the temperature of the air blown through the diffusers by regulating the submaster thermostats within the diffuser system. In the event of a rapid change of outdoor temperature, the submaster thermostat can be manually controlled to prevent an unnecessarily heavy load on the air conditioning equipment. Master control, indication and recording of the air conditioning system operation are provided by the various instruments mounted on a panel (Fig. 37), located in the monitoring room above the manufacturing area. Here are located the differential pressure controllers which stabilize the static pressure in the main building areas; and the circular chart, wet and dry bulb differential temperature controller which controls the fresh air intake and re-circulation dampers. In addition, a wet and dry bulb strip chart recorder

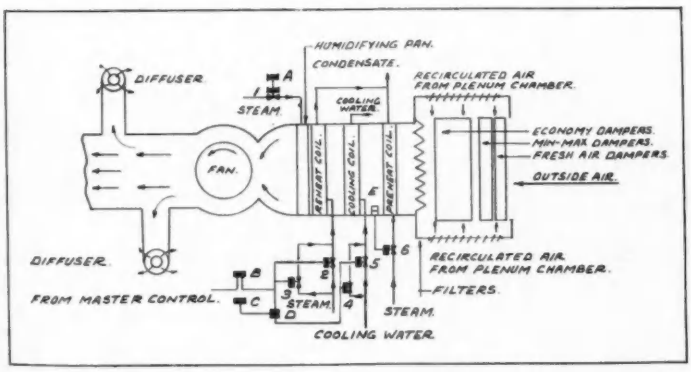


Fig. 36. Winter and summer, a wet and dry bulb differential recorder-controller compares the outside and inside temperatures and, in effect, determines whether it is more economical to admit fresh air into the building or to condition the air already inside

provides a continuous measurement of outdoor conditions.

Conclusion

There is no better way to conclude this short series of articles than with a few notes on the selection and operation of plant. An outstanding factor is, of course, economy in operation; provided this is not practiced to the extent that the manufacturing process is impaired. Initial cost is also a consideration not to be overlooked, but it should be borne well in mind that too much paring can easily lead to unsatisfactory, and sometimes costly operation.

First and foremost, a clear specification of the duties required of a plant should be given, and the manufacturers requested to make provision for effecting operating economies wherever possible. During the heating season, for example, waste hot air from certain rooms may be used for heating other rooms; where circumstances and factory regulations permit. Furthermore, since the temperature of heated air used in air conditioning is comparatively low, waste heat in manufacturing processes may often be employed for heating the air or humidifying water.

Resort should be had to air recirculation wherever possible, as should also the automatic control of the air conditioning processes throughout. The fans and motors utilised for air distribution should be subject to careful selection. These are usually required to operate over a wide range of loads and should therefore have flat characteristics suited to such duties. They should be chosen with regard to running costs as well as first cost. A small fan may be cheap but may use more power than a larger size. Variable speed equipment is also very desirable.

A properly designed plant, equipped with automatic controls in a proper adjustment should function to give the desired environmental control at all times. Nevertheless, as stressed by Longworth[1] this does not mean that the plant can be left to entirely run itself. Automatic controls are only aids to control. They require supervision, care and maintenance and, above all, their performance must be checked continually. In addition to the maintenance of the air conditioning controls, full mechanical maintenance must be given to fans, motors, pumps, spray nozzles, dampers and filters. Failure to do so will lead to excessive fuel and power consumption as well as unsatisfactory conditions in the working spaces.

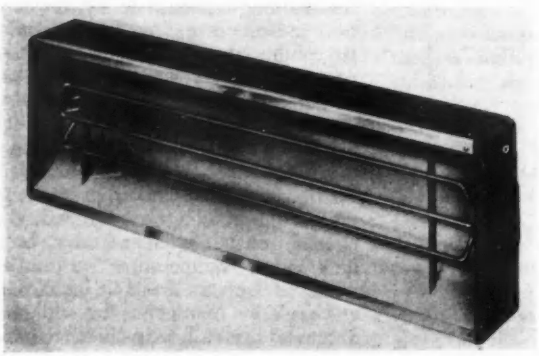
Reference

(1) Longworth, A. L. Fuel and the Future (Air Conditioning Plant in Cotton Mills), Ministry of Fuel Conference, London, Oct. 1946.

New Infra-Red Projector

AN improved version of their standard infra-red projector which incorporates a tubular metal-sheathed heating element is announced by Metropolitan-Vickers Electrical Co. Ltd., Trafford Park, Manchester 17. These projectors are designed for general infra-red heating applications such as moisture extraction, pre-heating, etc. They can be fitted end-to-end to form continuous troughs, assembled in banks, or used in angular formation to accommodate products of irregular shape. They can also be built into an enclosed plant, or used as robust portable units on stands. The end and back covers can be dispensed with where close spacing is desirable such as in enclosed ovens. These covers are robust steel pressings with ventilation louvres instead of perforations.

Methods of supporting the projectors have been simplified: pressed steel brackets readily clipped into slots, enable the units to be attached to 1 in. dia. conduit or bar. Alternatively, the slots can be used to bolt the projectors to angle or slotted angle. Conduit entry is catered for by a new type fixing plate enabling the conduit to be attached by locknuts. The highly efficient anodised aluminium reflector and metal-sheathed element remain unchanged apart from an improved method of supporting the element in the reflector. Terminal arrangement has been improved by the use of nickel-plated steel bars in place of copper rod, and a simple arrangement allows the projector to be converted for use on d.c., single or 3-phase a.c. supplies.



The 3 ft. M.V. infra-red projector with tubular metal sheathed elements

Clutch Couplings, etc.

Twiflex Couplings Ltd., a subsidiary of Sheepbridge Engineering Ltd., announce that Caselco Ltd., of 46 Park Square, Leeds, have been appointed the sole selling agents for Yorkshire. They will handle the complete range of Twiflex products, including automatic clutch couplings, and flexible couplings, overrun couplings, holdback brakes and other products.

Suitings and Coatings

The patterns reproduced on the facing page are a selection from some of the recent constructions developed by William Brown, Sons and Co. Ltd., Wilderbank Mills, Galashiels. Brief details are as follows:—

(1) In black, white, fawn, cream and green yarns, this fancy cheviot suiting is 18/19 ozs.

(2) Ladies' fancy cheviot coating (17/18 ozs.) in two attractive shades of blue and light green.

(3) Hard wearing and distinctive cheviot trousering.

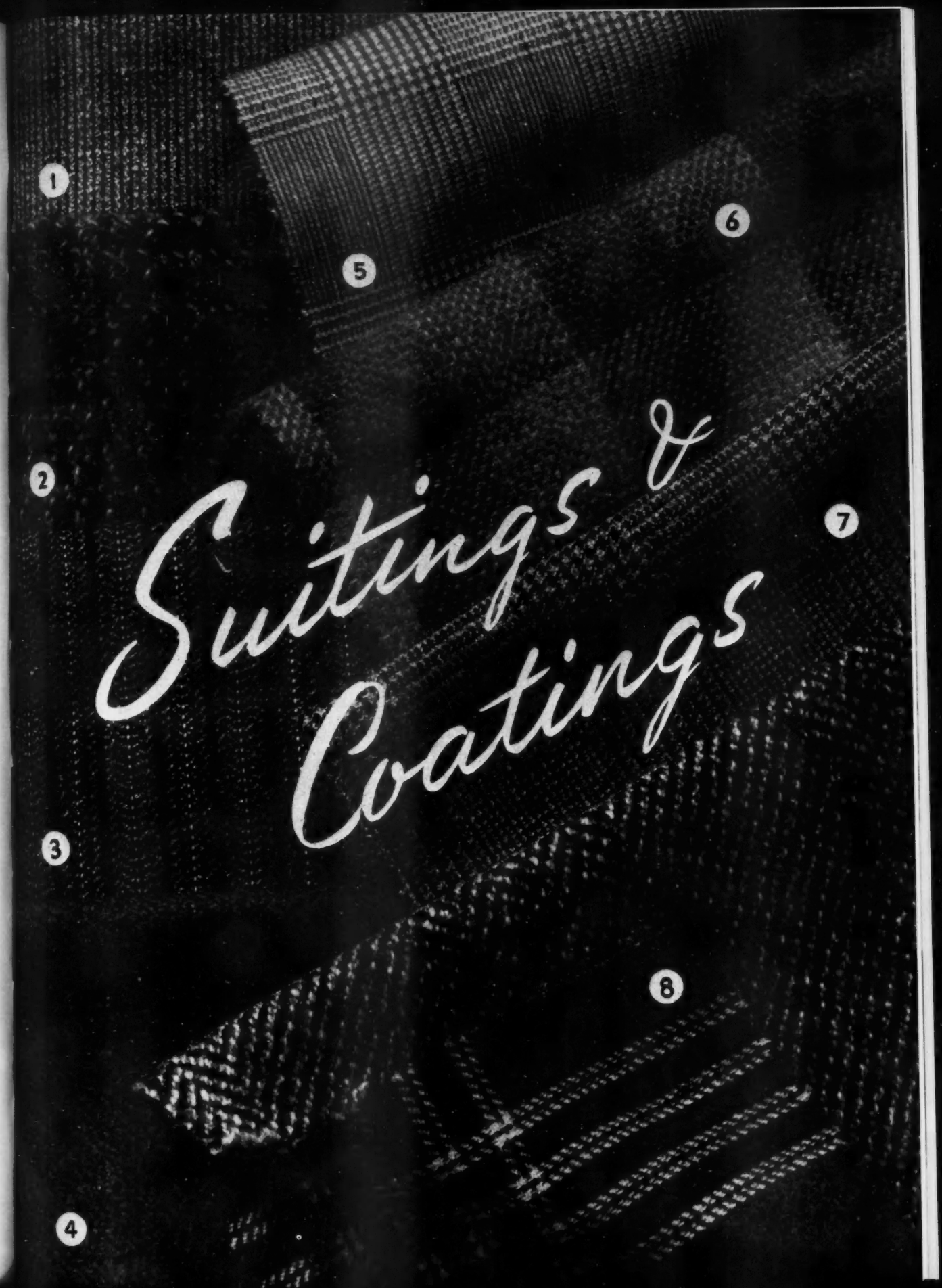
(4) Characterised by its quiet tones and remarkable handle this luxury sports suiting is 15/16 ozs.

(5) Gents' lightweight worsted suiting with yarns of light blue, chocolate, and yellow.

(6) Ladies' fancy cheviot suiting or skirting utilising yarns of very attractive shades—blues—maroons and greens—(14/15 ozs.).

(7) A 17/18 ozs. all twist worsted suiting featuring black, light blue, green and wine coloured yarns.

(8) Gents' double cloth coating. Twist cheviot face and botany worsted lining.


Suitings & Coatings
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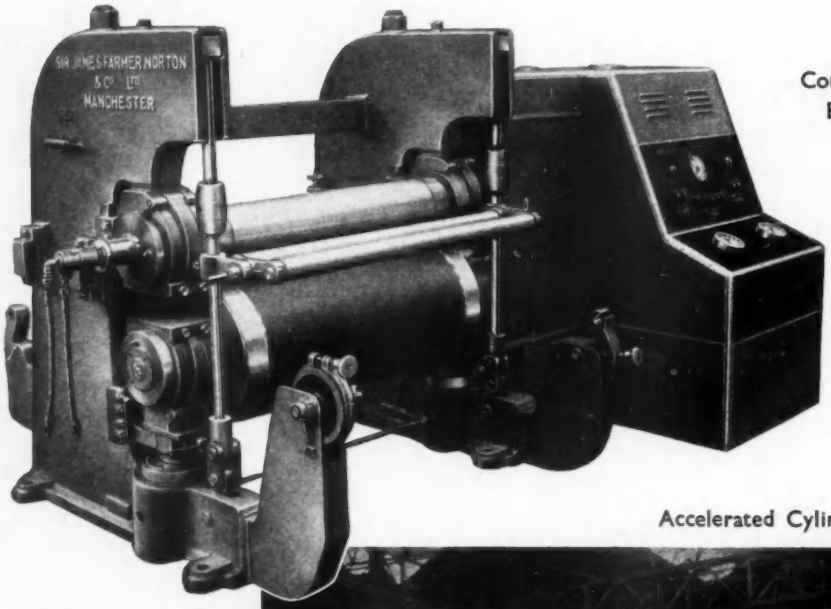
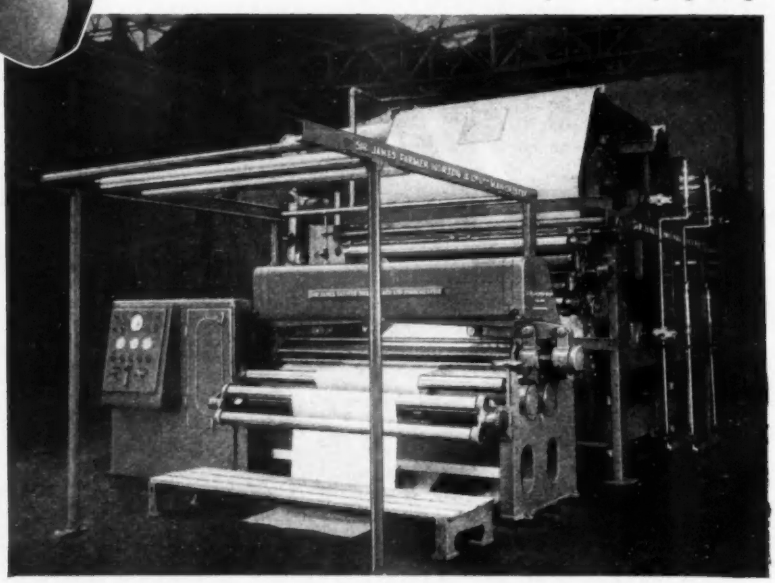


Combined Glazing and Embossing Calender

Accelerated Cylinder Drying Range



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The Development of Pirn Winding Mechanism*

A review of some of the many important developments which, collectively, have resulted in a range of highly efficient, streamlined machines designed to produce precision built pirns at high speeds with minimum attention from the operative

By D. BRUNNSCHWEILER, M.SC.(TECH.), F.T.I.

FOR the purpose of this account, a pirn (sometimes termed a quill or weft bobbin) will be understood to be any cop-built weft package used in a broadloom shuttle. Pirns are wound on various types and shapes of tube made of wood, paper, plastic or metal. A pirn for an automatic loom wound on a plain tapered tube is shown diagramatically in Fig. 1 where AB is the front chase, A and B being respectively the nose and shoulder (or base) of the chase, and CD is the back chase.

The angle the chase makes with the pirn axis ranges from about 7° for smooth filament yarn wound at low tension, to about 20° for hairy fibrous yarns wound at higher tension. The angle is ideally made as large as possible to accommodate the maximum volume of yarn within the shuttle but is limited by the clinging properties of the yarn. Smoother the yarn and lower the winding tension, and greater is the tendency to premature sloughing-off during weaving. E is the yarn bunch formed by an auxiliary motion at the commencement of winding.

* *A paper given to a course on "Weft Preparation" organised by the author at Manchester College of Science and Technology. The course comprised seven lectures, all of which have appeared in previous issues of "T.M." during* 1957.

Table 1
Development of Traverse Mechanism and Spindle Speed

Date	No. of spindles served by one traversing cam	Typical spindle r.p.m. (dependent upon wind and yarn)
Pre-1900	60 or more	1,000
1906	20	2,000
1920 onwards	1 to 4	4,000 to 8,000
1950 to date	1, either with specially light reciprocating parts, or with a rotary traverse	8,000 to 12,000

Table 2
Development of Automatic Pirn Transfer

Date	Type of Winder	Operatives' Work (in addition to creeling and piecing)
Pre-1936	Non-Automatic	Doffing; Box or Tray Loading
1936	Automatic Doffing	Magazine Filling; Box or Tray loading
1948	Automatic Doffing, Magazine Filling and Box or Tray Loading	Hopper Filling; Box or Tray Removal. (Usually by ancillary labour)

The "wind" of a pirn is the number of coils of yarn wound on the chase between nose and shoulder. Unlike pirns produced by direct spinning at the ringframe where the number of coils between B and A is usually three times greater than between A and B, on pirn winding machines the number of coils wound is the same in each direction, varying between about 3 and 20, low values being associated with coarse yarns and high chase angles, and conversely. The reason for the difference between pirn winding and direct spinning practice appears to be mainly a matter of tradition.

The direction of rotation of the pirn during winding is only important insofar as yarn twist is affected. Yarn is wound off from a pirn over the nose, and in so doing twist is either inserted or removed. With lively yarns (i.e. with unstable twist) it is always preferred to remove twist during unwinding as this discourages snarling, but with soft twist yarns the opportunity may be taken to insert a little more twist at no extra cost. Generally the amount of twist involved is in the region of 0·3 to 0·6 t.p.i. The rule is that when unwinding yarn from a pirn wound on a clockwise rotating spindle (looking at the front chase end) "Z" twist is inserted in the yarn, and when unwinding from an anti-clockwise rotated pirn, "S" twist is inserted. For comprehensive details of pirns and chase settings during winding the reader is referred to a paper on "The Weft Pirn" by H. L. Muschamp (Journal of Textile Institute, Vol. 43 (1952), p.793).

Methods of Traversing

The most primitive type of pirn winder still used by home hand weavers consists of a spindle on which the pirn tube is placed and which is turned with one hand while the fingers

Fig. 1. Axial cross-section of automatic loom pirn

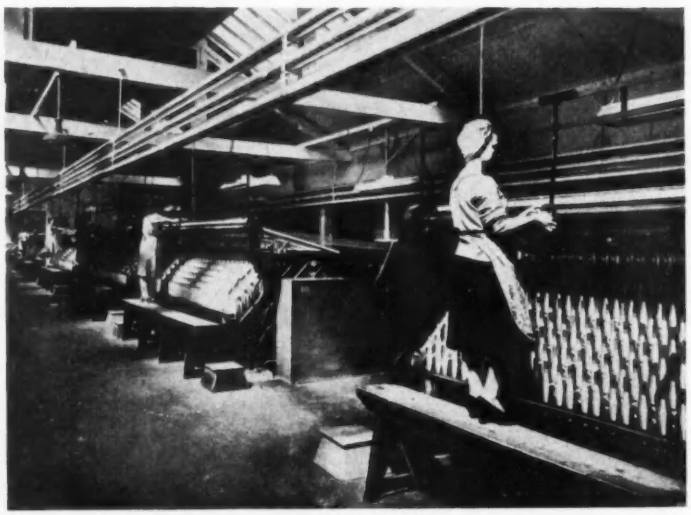


Fig. 2. The Holt multiple spindle pirn winder fed by warp

of the other hand lightly traverse the yarn to and fro to form the chase. In the mechanisation of pirn winding which, historically, accompanied the development of the mule, pirn winding machines took the form of vertical spindle frames in which one cam served to traverse yarn guides up and down for the whole frame. This resulted in low cam speeds, and hence in low spindle speeds, generally below 1,000 r.p.m. A modern multiple vertical spindle pirn winding machine with the yarn supplied on warp is shown in Fig. 2.

Instead of traversing a yarn guide, it is possible to keep the guide stationary and to reciprocate the spindle. While this system has certain advantages, the mass of the moving parts is relatively high, and the method has been infrequently adopted in recent years. The type of movement given to the thread by the traverse appears never to have been properly investigated. It is normally a uniform linear rate, but that it need not necessarily be so is shown by the continued success of an approximate simple harmonic movement used on super cop winders.

The "Leesona" Style 90 winder, which is still extensively used, was introduced about 1906 when it marked a considerable step forward in permitting spindle speeds up to and higher than 2,500 r.p.m. One positive cam serves 20 spindles through a rocking shaft. All the spindles must have the same wind, but traverse length can be individually adjusted for each spindle. Probably no winding machine has ever been used for such a wide range of textile materials. Since the Style 90 machine, most models have had one positive cam serving each spindle, the cam being located in a gear box behind the spindle.

Machines such as the Schweiter SRDL which traversed the spindle enabled speeds in excess of 3,000 r.p.m. to be achieved, while other machines with one cam per spindle traversing the yarn guide have permitted speeds of 5,000 r.p.m. until today, with the employment of very light reciprocating parts speeds in the region of 7,000 and 8,000 r.p.m. are usual. Particular mention should be made of 4-spindle units such as the Hacoba and Britoba machines where one cam serves all spindles. This is an ingenious arrangement with all the advantages of one cam per spindle, since the positive cam has two followers, each of which connects with a twin yarn guide.

Having the traverse cam in a gear box mounted behind the spindle means that with, say, 8 ins. pirns a relatively long connection between the cam follower and the yarn guide is required. In order to shorten this connection and so reduce the reciprocating masses various solutions have been tried. On the Rawson and Hacoba single spindle models a small positive cam moves along with the thread guide, while on the Muschamp SS 100 a negative face cam with nylon follower and light wire guide are used. The Schweiter MS winder has a light guide oscillated from a rocking rail running the full length of the spindle, and the Harrison pirn winder uses a long rotating cam bar for the same purpose. With a suitable high wind, these developments have permitted practicable spindle speeds up to 10,000 r.p.m. to be achieved. For exhibition purposes spindle speeds of 12,000 and even 15,000 r.p.m. have been achieved, but at these very high speeds the problem of vibration arising from slightly eccentric pirns becomes a very serious matter.

A recent development featuring low reciprocating masses is the Scharer serrated bar traverse. Here the yarn is not held in a conventional guide, but lies in a notch on a reciprocating serrated bar moving parallel with and by the side of the spindle. The yarn lifts itself from one notch to the next by means of the diameter control mechanism, and so the mean winding position is advanced. While only suitable for cotton and similar yarns a standard spindle speed of 11,000 r.p.m. is given.

Apart from its use on several types of super cop winder, the use of rotary

Fig. 3. The Muschamp "Weftmaster" non-automatic pirn winder

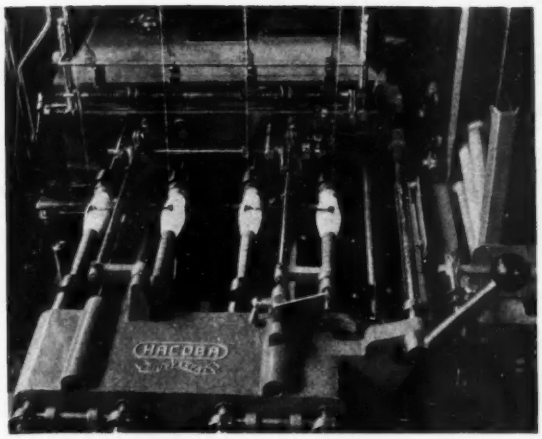


Fig. 4. Close-up of winding on the "Hacoba" 4-spindle automatic winder

traverse mechanisms on pirn winders is particularly associated with the Schlafhorst ASE machine where complete elimination of reciprocating parts permits spindle speeds of up to 12,000 r.p.m. with suitable yarns. The yarn is traversed by following a groove in a small rotating drum positioned by the side of the chase. A most interesting type of rotary traverse was designed for use on the Barber-Colman automatic pirn winder. The pirn was partially surrounded by a rotating co-axial traversing tube which slowly advanced as winding proceeded. The yarn was held against the oblique-ended tube (Fig. 6), one revolution of which provided a double traverse. This unique traverse allowed spindle speeds of 15,000 r.p.m. to be used, and it is most unfortunate that the manufacture of the machine was discontinued for economic rather than technical reasons.

Two auxiliary motions associated with the traverse are layer locking devices and hard nosing motions, both of which are intended to improve package stability. The former is a supplementary traverse of very short amplitude which is superimposed on the main traverse movement either by traversing the main cam slightly, or by using a multiple throw cam making one revolution for two or three traverses, the length of successive traverses differing slightly. The hard nosing motion adds more tension to the yarn when winding on the nose than when winding on the shoulder of the chase.

Pirn Diameter Control

For a given yarn, pirn diameter is determined by the rate of advancement of the yarn guide, the faster the rate the smaller the diameter. If diameter control is feelerless, as on a spinning machine, then the rate of advancement is pre-determined, but more usually on pirn winders the rate is determined by a feeler which contacts the pirn chase. Both methods have their advantages and disadvantages. The best known feelerless winders are the 4-spindle Hacoba and Britoba machines, and more recently the Unifil loom winder. On these machines, if the same diameter of pirn is to be produced and the yarn count is changed, then the rate of guide advancement must be adjusted.

When a feeler is used, the same diameter of pirn is produced irrespective of the count of yarn wound.

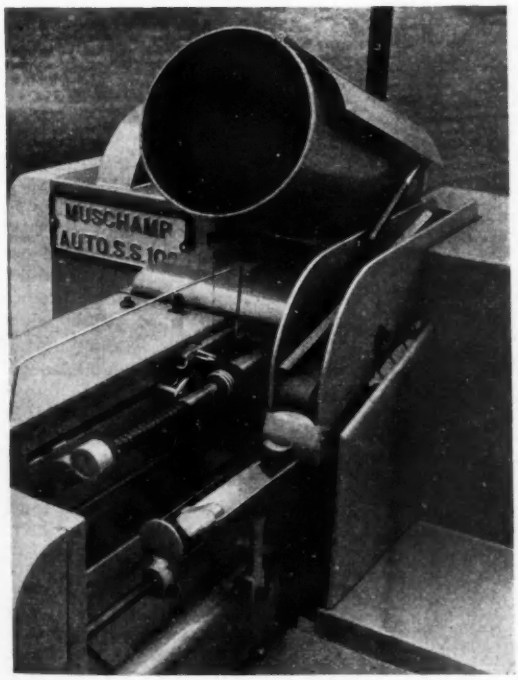


Fig. 5. Muschamp "SS.100" single spindle automatic winder fed from individual empty pirn hopper

Fig. 6. The Barber-Colman rotary pirn traverse

On some machines the feeler is in constant contact with the pirn, while on others the pirn is contacted only once every traverse. The commonest type of feeler used is a disc which may itself run on a threaded bar and so advance the yarn guide, or it may operate a clutch or its equivalent to engage a drive to move the guide. Other types of feeler are cup-shaped, and yet others are simple fingers, the latter being used on the Holt AP and on the latest Scharer winders. The feeler/feelerless control used on the Muschamp SS 100 machine has the good features of both methods since while the normal setting is for feelerless control, a feeler is present and should the pirn diameter increase beyond a pre-set amount the feeler will be contacted to speed up the rate of advance. An interesting development forecast is the use of a light beam and photo-electric cell to control pirn diameter.

Fig. 7. The Holt "A.P." travelling spindle automatic pirn winder with empty pirn feed

Automatic Doffing

Although spooling machines with automatic doffing were made by W. Weild, of Manchester at least as early as 1861, its application to pirn winding was rather slower. The distinction of being the first automatic pirn winder on the market belongs to the Hacoba machine introduced in 1936. On this machine the pirn is held between centres consisting of a driving headstock which holds the base of the pirn, and a tailstock which forms the front support. In doffing the front support is withdrawn so that the pirn falls by gravity on to a tray below in such a way that the trailing thread between the yarn guide and the doffed pirn is held opposite the driving headstock. A fresh pirn is now presented from a magazine, trapping the thread between its base and the headstock. All that remains to be done before winding re-commences is for scissors to cut the thread between the old and new pirns, and for the full pirn to drop into the pirn box.

The majority of automatic winders still use this principle of doffing, although there have recently been some refinements of mechanism introduced to get rid of the rather long thread tail which is left. The other method of attaching the thread to the new pirn, pioneered by Schärer, consists of having a driving head with one or more hooks which grasp the thread from the full pirn, causing it to be cut on a fixed knife while at the same time wound on to the fresh pirn. This mechanism has also been refined recently to eliminate a trailing weft tail. The method has been utilised on a Schweiter winder, and on the Unifil loom winder where the pirn itself is fitted with miniature hooks which catch the yarn to commence winding.

While automatic doffing removed one of the main manual functions of pirn winding, it introduced a much less onerous but nevertheless costly process in magazine filling. On most modern machines pirn magazines have been replaced by large hoppers into which fresh pirns are tipped, to be automatically distributed to all spindles forming a frame. In most instances the use of a hopper has about doubled the number of spindles allocated to an operative. Another development concerning pirn handling is that of automatic loading of full pirn boxes and trays, which is now featured on many machines. Special mention should be made of the Holt (Abbott pattern) hopper-fed automatic travelling spindle pirn winder, and the Muschamp SS 100 winder where each spindle is equipped with a small easily loaded hopper.

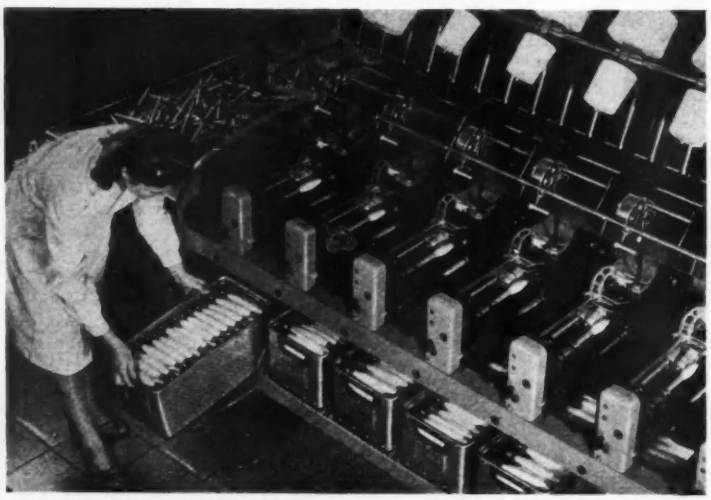


Fig. 8. The Schlafhorst "Autocopser" rotary traverse winder, showing full pirn box removal

T.I. Conversazione, 1958

Venue for the 1958 conversazione of the Textile Institute in December next, is to be the University, Leeds. The one held in Manchester recently was attended by over 1,000 people. The Institute will also hold a conference at Amsterdam in 1961.

Removing Dust, etc., in Cotton Cardrooms

A discussion of the results of work carried out at Shirley Institute during the past few years in developing and testing different methods of reducing cardroom dust

By F. BROWNSETT, B.SC.†

THE problem of dust in cardrooms has recently received more publicity with the publication of the third interim report of the Joint Advisory Committee on the Cotton Industry. In this report H.M. Chief Inspector of Factories commends the Shirley "Pressure Point" system to the cotton spinning industry, not only as a means of complying with the requirements of the Factory Acts but also to prevent as far as practicable the occupational disease, byssinosis. There are, of course, other ways of reducing the atmospheric dust load in the cardroom and this paper discusses the work carried on at Shirley Institute during the past few years on developing and testing different methods of reducing cardroom dust.

The dust load in the air of a cardroom includes at least four distinguishable components:

(1) Short pieces of broken fibre (known collectively as "fly") which are responsible for the major part of the visible cloud of dust.

(2) Fine dust particles from, say 10μ down to submicroscopic sizes, probably derived mainly from the dried plant tissue debris or "trash" which passes through the machines with the cotton.

(3) Bacteria, mainly soil and water organisms from the cotton fields and present in extraordinary large numbers in cardroom air.

(4) Fungal spore and hyphoe of which numbers are large but in no way comparable with those of bacteria.

Whilst there is no definite evidence it is thought the smaller particles are the more injurious to health particularly the protein fraction; it might also be useful to note that a particle size of 1μ is approximately $\frac{1}{25{,}000}$ in.

Several methods can be used for measuring dust load but, in general, there is no correlation between the results obtained by the different methods. The atmospheric dust can be collected by electro-static precipitation or by thermal precipitators and the dust deposits can be assessed by gravimetric means or by counting the number of particles of a certain size. Gravimetric methods are quicker than counting and the electro-static precipitator can deal with greater volumes of air than the thermal precipitator, thus obtaining larger deposits. For these reasons the greater proportion of the measurements were made of mass dust load (i.e. mgms. per cu.M) using a portable electro-static dust sampler for obtaining the deposits, and later, dust counts were made to confirm the main findings.

The arrangement of the electro-static instrument is shown in Fig. 1. The dust-laden air to be measured is drawn through a precipitating tube which is a horizontal stoppered glass tube 2·6 cms. internal dia. and 70 cms. long, the stopper carrying an axial electrode of $\frac{1}{16}$ in. dia. gold-plated steel wire, whilst an earthed screen of 12 mesh copper gauze is wrapped tightly round the outer surface of the glass tube. One end of the tube is of course open to allow air to enter. The centre electrode is connected through protective resistances to a 15,000 volt, a.c. supply, the current passing being approximately 300 micro-amps. The dust-laden air flows into the electric field between the wire and the earthed screen where it is ionised and the dust particles which therefore become charged are deposited on the walls of the tube and on the electrode, the amount collected on the latter being small compared with that on the walls of the tube. The cleaned air flows out of the precipitating tube through a branch connection to a calibrated gas meter, the air being exhausted by means of a pump. In order to collect the dust for weighing, a previously weighed sleeve of paper is inserted in the tube and the dust is precipitated on this sleeve. A control valve allows the rate of air flow to be varied and this is adjusted to give about 1 cu. ft. per min. The initial and final weighings of the paper sleeve are made on the oven-dry material to an accuracy of 0·1 milligram, the difference in weight representing the weight of dust collected.

The dust deposit obtained on the tarred paper in the precipitator makes possible a visual inspection of the type of dust but this inspection cannot be used for accurately measuring the quantities, since the different dusts can vary widely in colour and furthermore the very variable quantities of sooty material in the atmosphere could be a disturbing factor.

The methods of reducing dust are as follows:

(1) Removing all dust and potential dust from the cotton before the lap enters the cardroom.

(2) Operative masks.

(3) Ventilation of the cardroom.

(4) Oiling to cause the dust to adhere to the cotton.

(5) Hooding the cards.

Dust and Trash Removal

At first sight this would appear to be the logical way to overcome the problem and in fact much work has been done to try and reduce the dust and trash content of cardroom laps. Pneumatic conveyance of cotton in the blowroom helps considerably to reduce the dust content and the "Shirley" high-speed cage is also a help but it will be appreciated that apart from removing dust, trash must also be removed

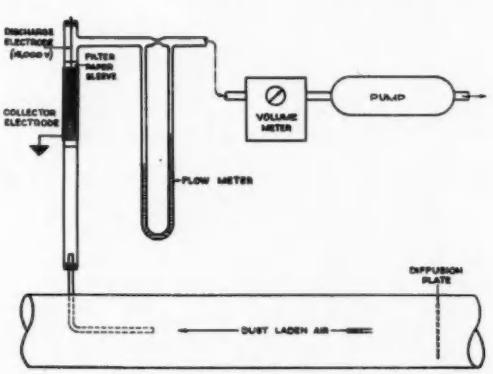


Fig. 1. Electro-filter for dust sampling

* *A paper given recently to Rochdale Cotton Spinning Mutual Improvement Society.*

† *British Cotton Industry Research Association.*

since the card can produce dust from trash in the carding action between cylinder and flats. Before however the trash removal can be efficient, it is necessary to open the cotton thoroughly and the Shirley opener has been developed for this purpose. A standard mill blowroom will remove, perhaps, 60% of the dust and trash that was in the bale before the cotton entered the cardroom, and using Shirley methods this reduction might be increased to 75%.

It is important to realise, however, that within the confines of present knowledge it is not practicable to remove all the trash before the lap enters the cardroom. Fortunately the taker-in is an efficient trash remover, eliminating perhaps 70% of the trash that was in the lap, and this elimination can be increased substantially in many cases by use of the "Shirley" modified taker-in undercasing. This is advantageous since it prevents some of the trash entering the zone between the cylinder and flats where there would be a strong chance of it being turned into dust.

Operative Masks

The use of operative marks must have been the first attempt to reduce the danger from cotton dust, and even in the days when cotton was processed in the home, workers probably tied pieces of cloth or pads of cotton wool across the mouth and nostrils. In view of the present extensive use of masks it was felt to be desirable to obtain some figures for their efficiency. For this series of tests the object was to imitate as closely as possible the conditions obtaining when a filter mask is worn, that is, an air velocity in the region of 20 ft./min., and to compare the efficiency of a cotton filter pad as customarily employed in face masks with an experimental resinated wool filter. The instrument used has been described earlier but in this particular application three sampling tubes were fitted each with its own volume meter and each provided with a conical aluminium filter holder. In the first series of tests one holder was equipped with a specimen of resinated wool fleece of uncompressed thickness approximately ½ in., a second holder carried a typical filter as used in face mask for cotton operatives, while a third tube provided a control measurement on the atmosphere which was in this case the region close to the doffer end of a card and about 5 ft. above floor level. The mean filter efficiency of the commercial cotton mask was 42% whilst that of the resinated wool was 88%.

The specimen of resinated wool fleece used in the first series of tests had a thickness approximately three times that of the cotton mask, although the resultant pressure drops were identical. The tests were therefore repeated with three thicknesses of the cotton masks, so that a comparison could be made between filters of equal thickness. During these tests the cardroom atmosphere happened to be much cleaner than previously so each set of measurements was therefore based on a run of longer duration than before in order to secure a weighable deposit. Despite a higher pressure drop across the cotton mask filter it was again less efficient than the resinated wool, although the difference in efficiency was less marked than when the filters were compared under conditions of equal pressure drop. Fig. 2 shows the dust deposit obtained in the first series of tests. A comparison of the dust deposits from the cardroom atmosphere and that following filtration by the commercial cotton mask show that the 42% dust removal obtained was chiefly of cotton fly rather than of fine dust.

Ventilation

The use of ventilation to reduce atmospheric pollution is a common practice but experiments have shown that to make a substantial reduction by this method, a considerable volume of air is necessary. An experimental ventilation plant was installed in a small room containing four cards. A ducting at ceiling height stretched down the room and from this ducting, branch pipes came down over the four doffing cylinders to open ends about 6 ft. from the floor. Dusty air was exhausted through these pipes at the rate of 800 c.f.m. per card and the ducting conveyed this air into the cellar under the cardroom where it was filtered before being recirculated back into the cardroom through parallel ducting over the taker-in cylinders. The dusty air was filtered in two stages, the initial one being a rotary cage that removed the coarse fly and the second stage an electro-static precipitator to remove the fine dust. The air recirculating back into the room was cleaner than the outside air but despite this the reduction in dust load from this ventilating plant was only about 30%. Fig. 3 shows an elevation of the cardroom and filter equipment.

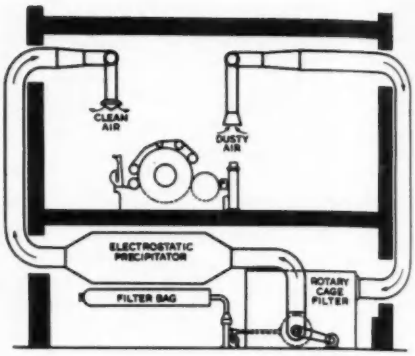


Fig. 3. Cardroom and filter equipment

The opportunity was also taken to test the efficiency of a commercial ventilation plant installed in a mill cardroom. Air was exhausted from grids in the floor at both ends of each row of cards (14 grids in all). This dusty air was conveyed by ducting to an outside shed where it was filtered by passing through tubular cloth filters of a patented construction. The filtered air was then recirculated back into the cardroom through two ceiling height ducts, one over the middle of each row of cards and one over the frames. The filter bags could be shaken mechanically and if required fresh air from outside could be brought into the room instead of filtered cardroom air. The first tests showed a very low efficiency for this ventilation plant and modifications were therefore made by the manufacturers which resulted in a final mean dust reduction efficiency of 22%. During these tests a large proportion of fresh air was being introduced into the room instead of recirculated air and the air volumes used were approximately 390 c.f.m. per card; the power used for

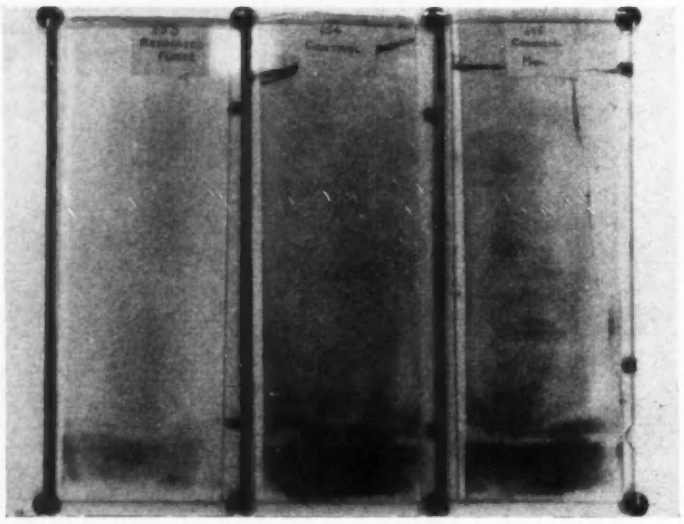
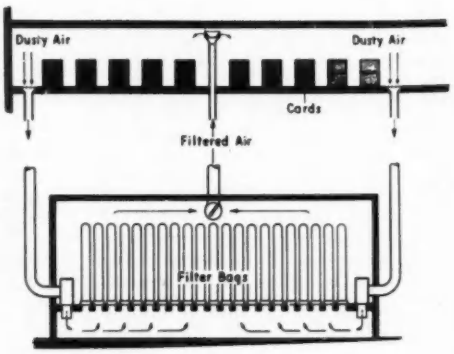


Fig. 2 (left). Dust deposit obtained in a series of tests

Fig. 4 (below). Cardroom and filter shed



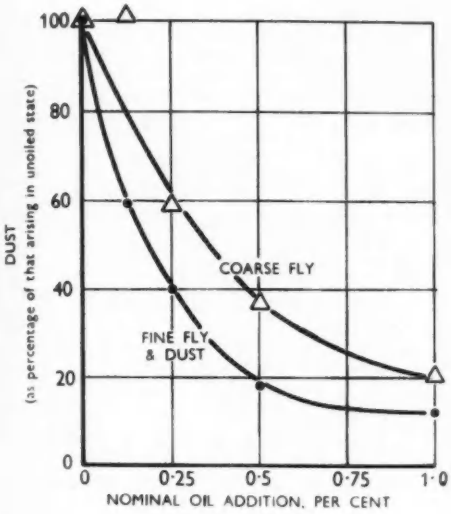


Fig. 5 (left). Summary of the results of adding oil to cotton on an experimental scale

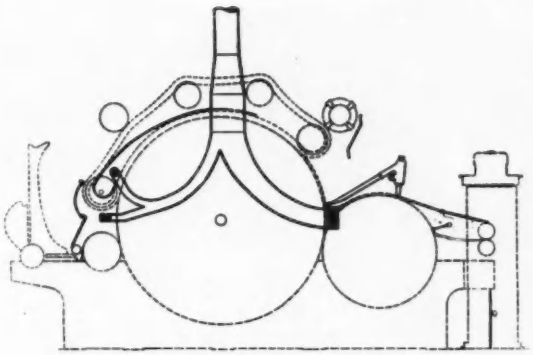


Fig. 6 (right). Dust extraction points on cotton card

ventilation was about 0·8 h.p. per card. Fig. 4 shows an elevation of the cardroom and the filter shed.

Oiling of Cotton

Shortly after the first world war oiling of cotton was carried out as a means of reducing the amount of dust in the cardroom but at that time no suitable method was available for measuring the dustiness and for various reasons oiling was discontinued. With the recent improvement in the types of oil available and technique for applying the oil it became desirable to make some quantitative tests on the effect of adding oil to cotton. The graph Fig. 5 gives a summary of the results obtained on an experimental scale. It will be observed that the addition of 0·25% oil gave a reduction of 60% in fine dust and 40% in coarse fly when using a Texas cotton (trash content 5·6%). The disadvantages of oiling, however, are that a weak yarn is produced, the resultant sliver has a tendency to nep which has a detrimental effect upon the appearance of the final yarn as judged by blackboard wrapping, and sometimes trouble is experienced with roller lapping and dirtier conditions in the spinning room.

Despite these objections, oiling of cotton was adopted fairly extensively by the trade and tests were made at 12 mills to find what the reduction of dust load was under commercial conditions. Tests showed that the reductions varied in the mills from 60% to 4%, the average being about 20% but subsequently the difficulties previously mentioned became so pronounced that a large number of mills have discontinued the use of oil.

Card Dust Hoods

Concurrent with the work previously described the problem of actually preventing card dust from entering the atmosphere was studied. Measurements were made to find the points on the card from which the majority of the dust was liberated and a hood was made on the basis of these results, to collect the dust at those points of liberation. This hood was fairly efficient but had several practical objections, so further consideration was given to the action of the carding engine and the reasons underlying the release of the dust.

The card consists essentially of three rapidly rotating cylinders which, in addition to their main functions of carrying cotton through the machine, act as fans and carry round considerable amounts of air. At the points where the cotton is transferred from one cylinder to another, air seals are formed and as a result zones of high air pressure are caused in the card. Air escaping into the atmosphere from the high pressure zones carries dust with it and is responsible for most of the dust in the cardroom.

The Shirley "Pressure Point" System is designed to make use of the high pressure zones to remove most of the dust which would otherwise be liberated into the atmosphere. By means of deflector sheets which concentrate the air flow to the required points, the need to exhaust air at a great rate is overcome. With the "Shirley" dust hood, based on the principles explained, air is exhausted from:

(1) The region round the junction of the card and doffer cylinder,

(2) Above the taker-in,

(3) Between the flats.

At the doffer region supplementary causes of dust are the oscillating action of the doffer comb and also the calender rollers. The calender rollers squeeze out the air mixed with the cotton in the doffer web as the cotton is compressed by the calenders and this air takes dust with it. The dust at these points is constrained within the fan action of the doffing cylinder by deflector sheets, and the fanning action is increased by the air extraction at the doffer and card cylinder junctions. Thus the action of the card is itself used to help to remove its own dust. The deflector shields that keep the dust liberated by the doffer comb and calender rollers within the fanning action of the doffer can be made of Perspex so that the carding can be readily inspected at all times. These deflector shields are hinged so that piecing up, stripping and grinding can be done without removing them from the card. The region under the calender rollers has

Fig. 7. Platt Bros. flat card fitted with Shirley hood

Fig. 8. Complete cardroom equipped with the Shirley "Pressure Point" system

been completely boxed in. This is to collect the fly that falls to the floor from the underside of the web and prevent it being blown about the cardroom by draughts. A door is provided for cleaning purposes.

The fly swept into the air by the action of the flat cleaning brush depends on the speed of the brush and may be reduced by using a slowly rotating brush of the Phillipson type. The fly from this source is collected by a sheet of perforated metal which holds the fly but allows air to pass through it. This perforated metal has three counterbalance weights, so as to hold the screen as close to the brush as possible and the screen is hinged so that it can be swung away to allow for removing the accumulation of flat strips. A piece of perforated metal in the form of an open-sided box was also used on the top of the coiler. This deflected and trapped the fly liberated as the sliver entered the trumpet on the coiler, but under mill conditions it proved to be easily damaged and its use has been discontinued.

The high pressure generated between the card cylinder and the taker-in end of the flats produces both tangential and radial air flow. The tangential part is dealt with by completely boxing-in the taker-in end of the flats down to the taker-in beater cover and exhausting air from one end. The metal sheets used for this are made in two sections, and are hinged so that they can be raised to allow the taker-in beater cover to be cleaned and the clearer roller to be removed when necessary (if required, these sheets can be removed and replaced very easily and quickly). The radial air flow is restricted by inserting a flexible metal sheet between the flats. This sheet passes over the first blockshaft and then rests on the inside of those flats, passing over the flexible bend for about two-thirds of the distance from back to front. The small air space formed at the taker-in end of the flats is shielded by two side pieces which also hold the metal sheet in position. Air is exhausted through one of these side pieces to relieve the pressure inside. It is not necessary to remove this sheet for setting the flats, being flexible, it can be lifted sufficiently to allow adjustments to be made and it will fall into position when released. If required, however, this sheet can be removed in a few minutes.

The portion of the deflector plate over the calender rollers can be hinged backward to allow the card tenter to piece up the web. Vacuum stripping of the cylinder and doffer simultaneously can be performed without touching the hood in any way. The doffer can be ground without removing the hood by hinging forward part of the doffer deflector plate. An adjustable jockey pulley is used so that the belt from the card cylinder to the doffer does not touch the air duct. The card can be brush-stripped in a similar way, except that in this case the jockey pulley is not necessary since the doffer is not then driven directly.

Tests were made on a single card equipped with a Shirley dust hood, at the Shirley Institute, and also on 32 cards so equipped in a partitioned-off section of a large cardroom in a mill. The reduction in the total mass dust load of the cardroom air in these tests varied from about 84% to 94%. The volume of air removed by the Shirley "Pressure Point" system is about 250 c.f.m. per card and it is suggested that this air should be removed from the cardroom completely, the coarser fly taken from it and the air then liberated outside the mill. It is very strongly recommended that this air should not be recirculated back into the cardroom since it still contains the fine and harmful dust. For practical reasons it is convenient to group the cards in units of about 30 and the power required to operate the fan will average ¼ h.p. per card. Fig. 6 shows a line diagram of the extraction points on a card section. Fig. 7 is a photograph of a single Platt's card fitted with a Shirley hood and Fig. 8 a photograph of a complete cardroom equipped with the Shirley "Pressure Point" system.

Apart from any question of measurements and the fact that there is much less visible dust in a cardroom so equipped, the atmosphere in a cardroom with the Shirley system is not offensive to breathe in contrast with the original conditions. In fact, byssinotics, who become distressed after working in unequipped cardrooms no longer experience that distress. A further point is that the room is much cleaner and in one case, a cardroom that needed cleaning twice daily now only needs cleaning once per week.

Recent Development Fabrics

Photographed full size for purposes of detail, the ten patterns on the facing page are a small selection from some of the extremely interesting development constructions recently issued by Courtaulds Ltd. Brief particulars are as follows:—

(1) CF2922/7. A 5/7 ozs., 12-end fancy tailored dress fabric. Warp—100 (22) den. "Seraceta"/"Duracol," black. Weft—Picked 6 as /4 (a): 6 as /3 weft.

(2) CF3041/3A. A 5½ ozs., 12-end diamond type dress fabric. Warp—360 (65) den. "Seracour"/"Duracol," chestnut, type 300/20. Weft—(a) 360 (65) den. "Seracour"/"Duracol" chestnut, (b) 360 (65) den. "Seracour"/"Duracol," chestnut, 1/100 in. emerald "Lurex."

(3) WL53. Ladies' 9 ozs., plain weave dry cleanable costume or dress fabric. Warp—2/36's W.C., 50%, 4½ den., 6 ins. "Fibro"/"Duracol" slate and 50% 64's wool blend. Weft—12 sk., 50%, 4½ den., 2 ins. "Fibro"/"Duracol," black; 30% 58/60's white wool neps and 20% 58/60's black wool.

(4) WL19B. Ladies' 21 ozs., 2×2 twill, dry cleanable boucle coating. Warp—4 sk. boucle, i.e. 16½ sk. 50%, 3 den., 2½ ins. matt "Fibro" and 50%, 50/52's wool. Weft—2/22 c.c., 3 den., 2½ ins. matt "Fibro," as warp.

(5) F2838/2A. A 4 ozs., 5-end satin washable dress print. Warp—1/60's c.c. cotton spun, 1 den., 1/16 ins. strong bright "Fibro." Weft—As warp—1/40's c.c.

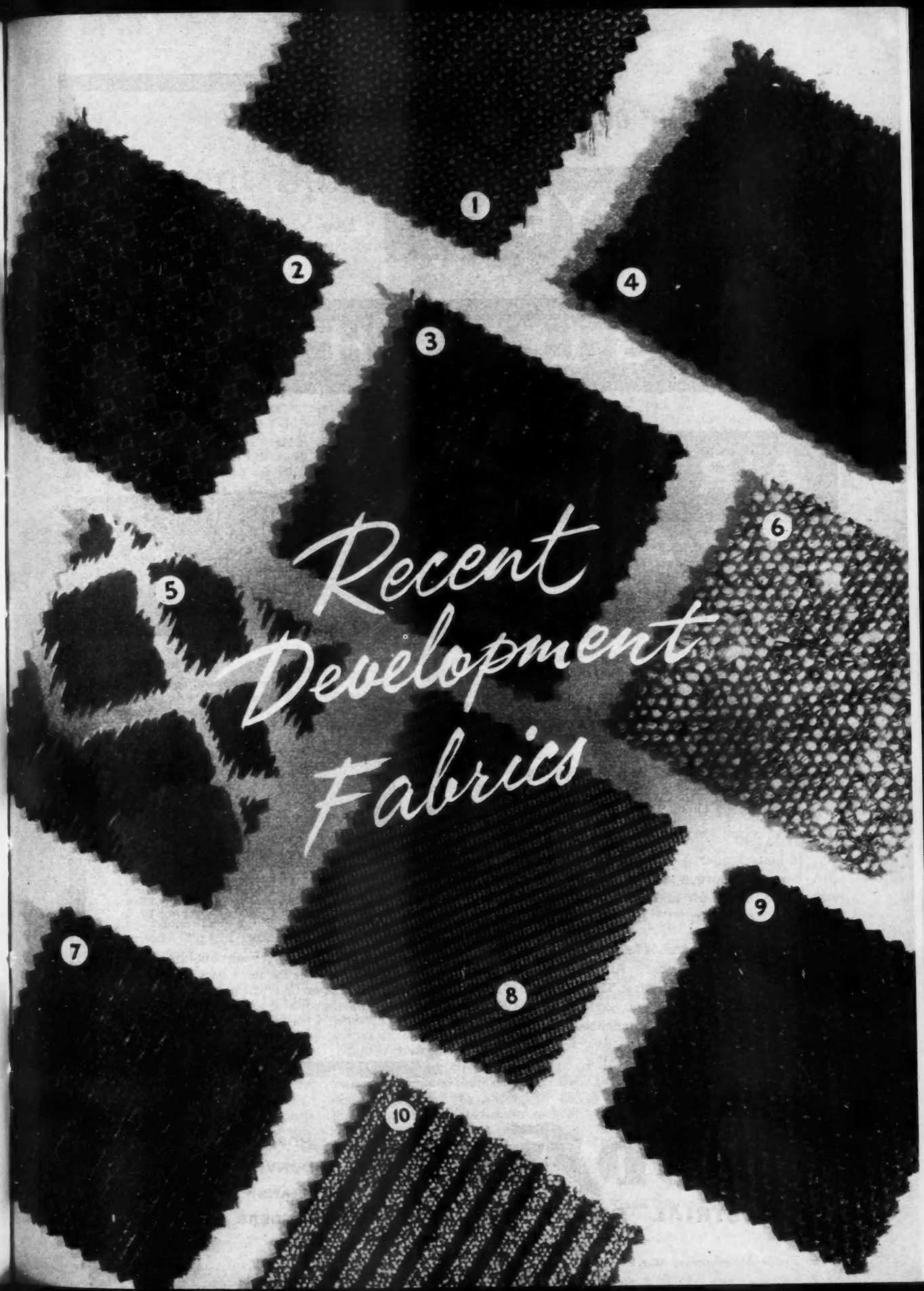
(6) WL17A. Ladies' 13¾ ozs., 2×2 twill, dry cleanable tweed coating. Warp—18 sk. 50%, 4½ den., 2 ins. matt "Fibro," and 50%, 56's wool (yarn dyed). Weft—As warp and 3½ sk. 45%, 8 den., 4 ins. crimped "Fibro"; 45%, 65's wool and 10%, 300 den. "Ribbonfil" cut tow.

(7) CF3161/1A. Ladies' 5-end weft satin dry cleanable dress and suiting fabric. Warp—100/24 viscose/"Duracol" gunmetal. Weft—25 sk. 50%, 3 den., 2½ ins. "Fibro," black, and 30% wool.

(8) Ladies' 5/7 ozs., 12-end fancy tailored dress fabric. Warp—100 (22) den. "Seraceta"/"Duracol," black. Weft—360 (65) den. "Seracour"/"Duracol," oyster shell A210 (Type 300/20).

(9) Ladies' 5/7 ozs., 12-end fancy tailored dress fabric. Warp—100 (22) den. "Seraceta"/"Duracol," black. Weft—(a) 360 (65) den. "Seracour"/"Duracol," smoke, 6126 (Type 300/20); (b) as (a) doubled with 1/100 in. gold "Lurex," 3/4 turns.

(10) WL54. Ladies' 8½ ozs., plain weave, dry cleanable suiting. Warp—2/36's W.C. 50%, 4½ den., 6 ins. "Fibro"/"Duracol," slate, and 50%, 64's wool blend. Weft—As warp and 9 sk. boucle. 30 sk. 50%, 1½ den., 1/16 ins. matt "Fibro"; 50%, 60/64's white wool; 2/22 c.c., 3 den., 2½ ins. "Fibro."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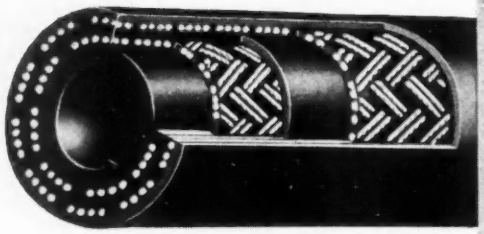

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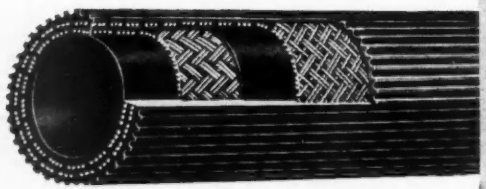

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Recent Spinning Developments

A discussion of some of the newer machines introduced in recent years, together with an estimation of their performance regarding yarn quality, higher drafts, larger packages, versatility and efficiency

By NORMAN ROPER, B.SC.(ECON.), A.T.I.

THE worsted and long-staple synthetic fibre trades have been in a state of irrepressible change during the last few years. Before 1939, most European mills were equipped with the traditional drawing systems; the Bradford or open drawing system, the Continental or French system, or the Anglo-Continental system, which, of course, is a compromise between the Bradford and Continental methods of processing and is said to be more flexible. Since the war, however, as described in previous articles, some new systems have been developed based on high speed intersecting pin drafters. These systems originated in America, but various other machinery manufacturers, both at home and on the continent, have followed the American lead, and have produced new, abbreviated systems of converting top to roving.

As far as spinning is concerned, all other spinning trades have seen the development of higher drafts in recent years. On conventional worsted spinning frames drafts of 10 are rarely exceeded on account of the increasing irregularity which occurs since the short fibres become completely out of control and excessive "plucking" occurs. If satisfactory yarns can be produced at much higher drafts, then some of the previous drawing processes may be omitted. Thus, if yarns of a commercial standard can be spun from 30 drams per 40 yards slubbing, the reducing and roving stages are omitted and drawing terminates at the finisher box. There is, therefore, a demand for spinning machines capable of giving increased drafts and of handling all types of roving from any system of drawing which is likely to be used in the foreseeable future.

A further factor to be taken into consideration is the cost of labour. Since 1939, this has risen with ever increasing speed, and up to the moment there is no sign of falling off in the rate of increase. On this account there is a clear necessity for the reduction of labour charges in all processes of manufacture. In the worsted trade the cost of spinning, twisting and winding is all-important. A new spinning frame must be so designed as to reduce as far as possible labour charges in these departments and in this connection, it is of vital importance to increase the size of the spinning package.

The European worsted spinning trade is characterised by the very large variety of counts spun and types of wool used. There is also an increasing volume of synthetic fibres being used in the wool textile trade, whether in blends or as 100% synthetic fibre yarns. Existing machinery in these mills is very flexible; for example, the cap spinning frame. It is therefore essential that the new machines must possess equal flexibility, if not more so.

It is now proposed to discuss in detail some of the newer machines which have been introduced within recent years and to formulate an estimation of their performance from the points of view of yarn quality, higher drafts, larger packages, versatility and efficiency.

High Drafting

Hannah[1] has pointed out that the probability of short fibre acceleration, due simply to the presence of fast moving fibres, depends on fibre length distribution, on the relative magnitudes of static and dynamic friction, and on the draft, being slightly smaller at higher drafts. The probability of a fibre accelerating out of turn is considerably increased if the density of the fibre packing in the roving in the drafting zone is anywhere diminished, since then any contact with a fast moving fibre has relatively more effect.

We can now discuss the reason why conventional drafting machinery is inadequate at high drafts. The packing of the fibres depends on the tension, i.e. the drafting force, on the twist, and on the number of fibres in a cross-section of the roving. For spinning a given count, higher drafts mean thicker rovings and, hence, more fibres in need of control. In addition the roving has much less twist so that twist removal by the uncurling torque of the drafting fibres is more marked and, despite the tumblers, there is even less twist in the drafting zone itself. Thus at high drafts more fibres are to be controlled, but the drafting force and twist are both reduced and, in consequence, the system rapidly gets out of control.

The remedy would seem to be to increase the degree of fibre packing, either by direct application of pressure or by otherwise increasing the drafting force or the twist. At the same time it must be borne in mind that increasing the packing of the assembled fibres necessarily involves an increased frictional resistance to fibre extraction and consequently an increased stress in those fibres being withdrawn through the more closely packed regions, and this means that there is an upper limit to the closeness of the packing allowable. Adequate control of short fibres usually means excessive strain on the longer fibres which are liable to suffer breakage; it is precisely these fibres which we wish to preserve as they give strength and spinnability to the thread. Successful high drafting, then, depends upon resolving this dilemma of adequately controlling short fibres, without unduly straining the longer ones.

The "Megaflex" Ringframe

The "Megaflex" ringframe recently introduced by Prince-Smith and Stells Ltd., Keighley, has been designed to meet the modern need for higher

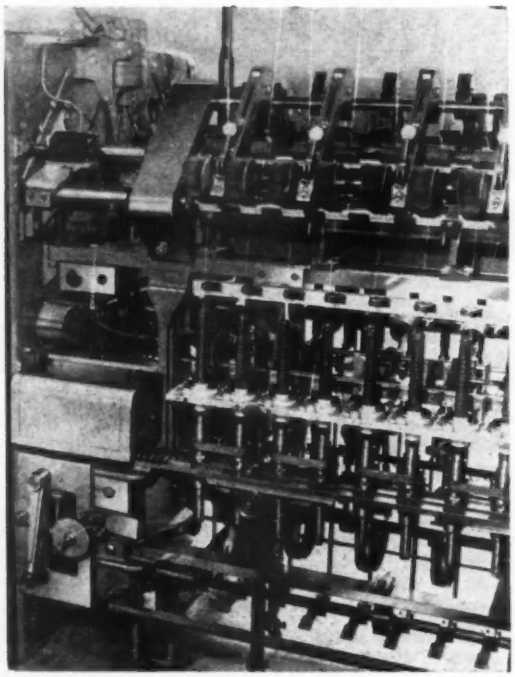


Fig. 1. The "Megaflex K.M.F.1" ringframe (courtesy, Prince-Smith and Stells Ltd.)

speeds, higher drafts, larger packages, reduced floor space, ease of operation and the mininum of maintenance. The machine is outstandingly versatile in its ability to suit a wide range of operating requirements, and is available in two models.

Model KMF 1 (Fig. 1) is equipped with apron high draft, capable of giving drafts from 10 to 20 and which can serve a dual purpose; either to spin from twistless rovings, prepared on the French or Continental system, or to spin from lightly twisted rovings prepared on cone machinery, as used in the Bradford and American Systems. Model KMF 2 is equipped with the Ambler "Superdraft" system, capable of giving drafts of up to 150 to spin from oil-combed wool slubbing such as prepared on the orthodox Bradford or Raper "Autoleveller" systems. It can also be used for rayon and synthetic staple fibres, when even higher drafts are permissible.

Model KMF 1

The apron drafting system (Fig. 2) as fitted on the "Megaflex KMF 1," should be fed with twistless roving or with roving having slightly less twist than is normally produced on cone roving frame. Materials with a staple length of $2\frac{1}{2}$ to 8 ins. can be successfully processed. Three lines of bottom rollers are used. The back roller is $1\frac{1}{8}$ in. dia., irregularly fluted, and adjustable in distance from $4\frac{1}{2}$ to 9 ins. from the front roller. The middle bottom roller is 1 in. dia., adjustable in distance from $2\frac{5}{8}$ to 3 ins. from the front roller. It contains a recess in which a synthetic rubber apron runs. The apron, driven by this roller, passes over a stationary tension bar set close to the bottom front roller in order to ensure good control of short fibres. One apron is provided for each spindle, and each apron is individually tensioned. The front roller is $1\frac{1}{2}$ ins. dia., hardened and irregularly fluted.

There are four lines of top rollers, three of which are spring weighted by means of individually calibrated and pre-stressed helical springs carried in the roller arm weighting device. These three rollers are of the same diameter, namely $1\frac{7}{16}$ ins., and are covered with synthetic rubber cots. A light carrier roller, $\frac{11}{16}$ in. dia., weighing $10\frac{1}{2}$ ozs., for untwisted roving, or $\frac{1}{2}$ in. dia., weighing $4\frac{1}{2}$ ozs. for twisted roving, is provided for controlling the short fibres at the nip of the front rollers.

Other features are a traversing condenser placed behind the back rollers to guide the rovings into the drafting zone and also to traverse them across the face of the drafting rollers. A floating self-threading condenser is mounted in the nip of the front rollers to minimise the fly waste usually present when high drafts are imposed. Two methods of drafting are possible with the apron system—

(1) Using a wide-faced $1\frac{7}{8}$-apron deflecting roller for wool, synthetic fibres or blends of wool and synthetic fibres, where the longest fibres in the blend range from 4 to 8 ins. in length. This is the single-zone slip drafting method.
Flexibility of fibre control is obtained by the use of the wide apron deflecting roller. The face of this roller is wider than the recess in which the apron runs, so that the deflecting roller is driven by contact with the apron driving roller. This manner of driving avoids a positive nip on the material and substitutes for it a "slip-draft" method of control, which is increased by radially displacing the deflecting roller so that it contacts an area of the apron. The greater the deflection of the apron, the greater is the arc of contact between the deflecting roller and the apron and therefore the greater the degree of fibre control.
When using this drafting mechanism for single zone drafting, a small back draft amounting to 1·2 to 1·6 is used between the back and middle rollers. This back draft helps to loosen the fibres a little and place them in the form of a flat ribbon on the apron, so that the control rollers might have a greater influence. The total draft applied may reach 20.

(2) Using a narrow-faced $1\frac{1}{4}$-in. roller, which fits into the recess of the knurled apron driving roller, for blends in which the longest fibres are below 3 ins., and the average is about $2\frac{1}{2}$ ins. A positive nip between the apron deflecting and the apron driving rollers is thereby obtained, added to which further fibre control can be gained by moving the deflecting roller forward as previously described. The "slip draft" now becomes a "break draft."

The "Megaflex" is made in 4, $3\frac{3}{4}$, $3\frac{1}{2}$, or $3\frac{1}{4}$ ins. pitch, the maximum ring diameter in each case being 1 in. less than the spindle pitch. Self-lubricating rings of conical section or small section doubling rings with helical grooves can be supplied. Two types of ring fixtures are made: (*a*) rings fitted in a ring plate or in

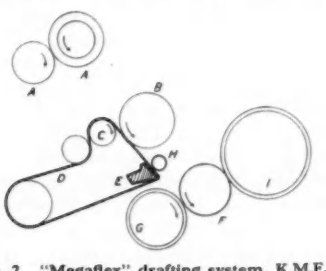


Fig. 2. "Megaflex" drafting system, K.M.F.1. A=Back rollers, B= Apron deflecting roller, C=Apron driving roller, D=Apron, E=Apron tensor bar, F=Top front roller, G=Bottom front roller, H=Carrier roller, I=Clearer

holders mounted on it and (*b*) rings fitted in individual ring holders on a ring bar, which can be adjusted individually to their own spindle. In case (a), small separator plates are secured to the ring plate, and in case (b) stationary, full length separating tins are used, which give better protection against "spinner's double" because the ring holders move between the separators all the time.

The spindle brakes are operated by foot, the brake itself functioning from inside of the frame. This arrangement allows the operative to take up a natural, unstrained stance when piecing up and leaves both hands free to work. The drive to the spindles is by tape from alloy pulleys on a central shaft, over two tension pulleys. The arrangement is such that either "S" or "Z" twist can be inserted without any adjustment to the tension pulleys or tape being required. Spindle speeds can range from 5,000 to 8,000 r.p.m.

Twizzle guides are fitted to hinged lappets, so that they can be moved back collectively out of the way when doffing. The lappets are fixed to a rail, which traverses with and in proportion to the movement of the ring plate, to give the necessary balloon control. A separate lifter motion on each side of the machine gives a cop type build. The standard traverse is 10½ ins. for a tube 11 ins. long. The spindle rail is stationary and the lifter movement is transmitted from a heart cam to the ring rail. An indicator lamp is fitted which lights when the lifter is in the correct position for commencing to spin.

A special feature of the motor drive is the reactor starting mechanism, which gives a slow smooth start of the spindles to reduce strain on the yarn and likelihood of end breakage when the machine is set in motion. Acceleration can be adjusted by a tap changing switch to allow for varying loads. When the power is switched off, an electrically operated solenoid brake brings both delivery rollers and spindles to a simultaneous smoothly controlled standstill and thus prevents over-running.

Model KMF 2

The addition of the Ambler "Superdraft" unit to the "Megaflex" ring spinning frame (Fig. 4) ensures rigid fibre control during drafting and enables wool qualities to be spun from considerably heavier slubbings than have been utilised in the past. The same slubbing can be used to spin a wide range of counts, and this increases the flexibility of the set of drawing and enables a saving in roving stocks to be made.

The Ambler "Superdraft" system, which can be fitted to any conventional spinning machine if required, utilises a roving made from standard types of oil-combed tops of 40–50 drams per 40 yds. for merino qualities and 60–70 drams per 40 yds. for crossbred qualities. This "roving" is produced on a Bradford type finisher so that the normal reducing and roving operations are eliminated. There is a prevalent tendency to assess the cost of drawing by the number of stages or operations but this, of course, gives a false impression. More important is the total number of machines and spindles in a set of drawing along with the total power, floor space and personnel requirements. The nearer the high draft process to the final spinning operations, the greater will the saving be, because the number of machines, operatives, and the money cost of production fan out rapidly, becoming progressively bigger at each operation. Ambler "Superdraft," by eliminating the expensive reducing and roving operations, cuts at least half, and more often two-thirds, off the total drawing cost.

An Ambler "Superdraft" fitted spinning frame can produce from the one "roving" weight the entire range of counts which can be spun from a wool quality. Change of count from, say, 40s to 20s can be effected in five minutes without "breaking down ends." In view of this a set of drawing can be kept producing one weight of "roving" irrespective of the counts being spun, so keeping a steady load on the drawing machinery and making unnecessary the excess machinery and operatives normally required to deal with the fluctuating demands for various weights of "roving." The flexibility of a spinning plant is enormously increased by this ability to spin all counts from one "roving" weight, not only from the point of view of quick delivery of yarn but also because of the greatly increased range of yarn counts which can be produced.

The Ambler "Superdraft" system, Fig. 3, consists of the back and front rollers with the "superdraft unit" (Fig. 36) placed between them. This latter consists of two parts:—

(1) The fibre guide, a piece of metal 1 in. long, shaped as to lead the roving into

(2) A pair of carrier or tension rollers, weighted and positively driven at a surface speed about 12% slightly greater than that of the back rollers.

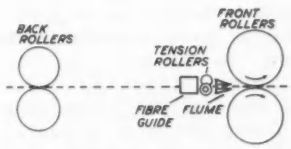
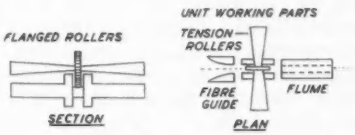


Fig. 3. Ambler "Superdraft" system



(left) Fig. 3A, (right) Fig. 3B

(3) The flume, a tapering piece of metal ¾ in. long, pierced by a funnel of rectangular cross-section which narrows slightly towards the forward end. The tension rollers are small in diameter and the top one is knurled. The bottom one is flanged so that the roving is compressed into a rectangular shape and held on all four sides. This provides a more even pressure than when the roving is squeezed through ordinary flat rollers. The complete unit is clipped on to a control bar and rests on "Oilite" bushes over the main driving shaft so that the small gears on the bottom tension roller engage with gears on the driving shaft.

The roving is stretched between the carriers and the back roller nip up to a length *n* times its former length, *n* being less than the draft between the back and carrier rollers. No break draft takes place here, but only a tensioning of the roving, the carriers slip over it. There is a further action of the carriers on those front beard fibres long enough to extend beyond the carrier nip. This is believed to be the main source of friction for tensioning the front fibres although there is also a tension from the force necessary to withdraw the fibres from the back zone.

In Ambler "Superdraft" spinning, the roving size is limited by both the dimensions of the tension rollers and the cross-section of the flume; too large rovings cannot be properly controlled by the carrier rollers, since the fibres bulge out of the flange, and if the rovings are too small the controlling effect of the flume is reduced.

The worsted spinner has two problems to face (*a*) to spin only one count. Here, the most economical method is to spin at the highest possible draft corresponding to the smallest flume setting. This will depend on the fibre length; longer fibres can be spun at higher drafts. The roving must not, however, to too large or the tension rollers will not control it. (*b*) To spin

several counts out of the same roving. The best method is to arrange to spin the finest count at the maximum draft and alter the flume settings for the other drafts.

The standard of Ambler "Superdraft" yarn, as regards regularity is either equal to, or better than, yarn produced on orthodox frames provided the critical setting conditions with regard to roving twist, flume setting, roller pressure, draft, etc., are satisfied. Simple formulae have been derived to enable these conditions to be quickly and easily achieved. The following formula has been found satisfactory for ascertaining suitable roving twist:—

$$\text{(a) White merino qualities: Roving twist (in turns per inch actual)} = \frac{3{\cdot}9}{\sqrt{\text{Roving wt. in dms./40 yds.}}}$$

$$\text{(b) Coloured merino qualities: Roving twist (in turns per inch actual)} = \frac{3{\cdot}6}{\sqrt{\text{Roving wt. in dms./40 yds.}}}$$

For crossbred qualities the corresponding numerator value is 4·2 and 3·9.

The ratch (i.e., distance between front and back roller nips) should not be less than 1–1½ ins. greater than the length of the longest fibre in the roving. Ratching shorter than the longest fibre always causes uneven yarn.

The flume setting is the distance between the forward end of the flume and the actual front roller nip. The design of the Ambler equipment allows a range of 0·53 in. to 2·2 in. The flume setting may be found from the following formula:—

$$\text{Flume Setting (ins.)} = \frac{20}{\text{Worsted Yarn Count}} + 0{\cdot}2$$

The setting given by this formula may have to be modified in practice by ± 0·2 in.

In some cases, particularly in merino qualities, the flume setting given by the formula may be too wide for the best spinning performance, as measured by end breakage and yarn levelness. If, therefore, an overlooker is not satisfied with the performance obtained, he should reduce the setting by 0·05 in. at a time until the spinning performance is satisfactory. After a change of flume setting the machine should be allowed to run for 5 mins. on the new setting before the yarn is inspected. In other cases, particularly in crossbred qualities, the flume setting given by the formula may cause the roving to break apart between the back roller and the superdraft unit. This indicates that the flume setting is too close. It should, therefore, be increased until the breaking apart of roving just ceases. This will be the best spinning position for that particular count and quality.

All standard types of oil-combed tops are suitable for Ambler "Superdraft" spinning provided that (*a*) the wool is scoured clean to normal standards prior to combing and (*b*) the combing oil is of a non-oxidising type, such as Munmor Chemicals "Slivsol." (Arachis or olive oils are not suitable because of their oxidising properties.)

The unusually high drafts of the Ambler system have brought about other problems which do not arise in the ordinary system. For example, an increased draft results in an increased amount of fly waste. This fault is extraordinarily exaggerated when spinning at high drafts due to the extra dispersion of the fibres being withdrawn from a much larger assemblage. If not corrected it may cause some trouble because of the licking tendency of the fibres round the top front roller. This was also found in high draft cotton spinning and sometimes it is partially corrected by placing fibre collectors as close as possible to the front roller nip. The collecting of these fibres has been achieved on the Ambler system (*a*) by lifting the draft zone plane to an angle of 70° with the horizontal and (*b*) by changing the small porcelain guides to ¾ in. dia. ones of porcelain coated wire. The latter causes the formation of a small balloon of yarn above the guide; this, and the fact that the twist coming from the spindle is now free to run right up to the front roller nip, overcomes most of the effects of fibre dispersion.

Another effect to be corrected is supposed static electricity generated during high drafting, which allows the fibres to lick round the top front roller. It is considered by Downs[2] that this licking may also be caused by the combing oil, which, after some time may form a coating on the front roller covering, usually made of synthetic rubber and cork. At present the following solution of anti-static is being successfully employed:—

Lissapol N	..	30 parts (by weight)
Sodium benzoate		2 ,, ,, ,,
Water	.. ..	68 ,, ,, ,,

The mixture is easily made and it is added at the can gill box in a proportion approximately 2% in relation to the weight of the wool. According to Downs, the success of this solution is not due to its anti-static properties but rather to its action as a powerful detergent in preventing deposits of combing oil on the roller covering.

The design of the front top rollers is

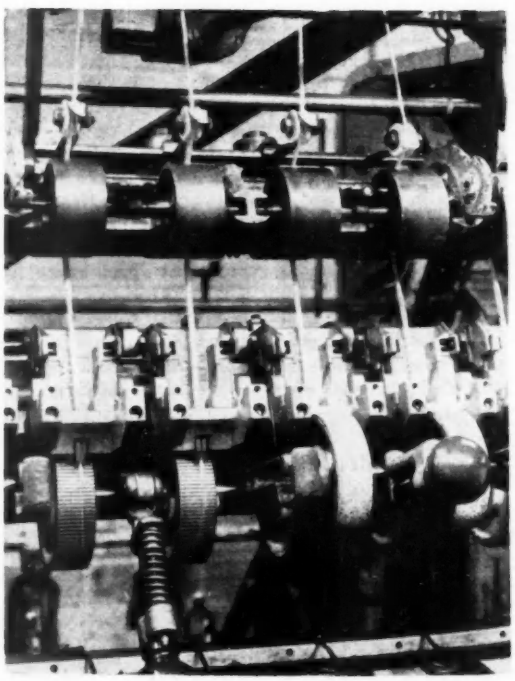


Fig. 4. "Megaflex" /A.S.D." ringframe, Model K.M.F.2 (courtesy, Prince Smith and Stells Ltd.)

of vital importance when very high drafts are employed. Any variation in the position of the roller nip may lead to an increase in yarn irregularity, which will probably manifest itself in a periodic form. The roving is thicker in high draft spinning so that any variation in nip-point, due to varying compressibility of the roller covers or from eccentricity of the front rollers, affect a correspondingly larger number of fibres. Hannah[3] suggests that the best way to minimise front roller nip variation is to maintain a sizeable "flat" between the rollers, which involves the adoption of an adequate material for roller covering. Synthetic rubber with granules of cork has proved to satisfy the necessary conditions. The effects of vertical movement of the top front roller has been prevented by an improved roller mounting and by using individual bearings so that one roller does not tilt another.

Tests carried out by Indarte[4] on Ambler and conventional spun yarns seem to indicate that Ambler "Superdraft" yarn has a greater inherent strength. This is known to be a usual result since the makers of the Ambler system recommend users to reduce their spinning twists by 5–10% and their folding twists by 10%. When increase in strength is unnecessary, it is usual to decrease the twist to a value giving the desired strength, so that the rate of production is increased. There is also a confirmation of this on cotton yarns spun by the Casablancas system, which are stronger than ordinary ones, as has been pointed out by Noguera[5], who suggests using this in three different ways in cotton spinning:—

(1) To spin from a cheaper material (shorter fibre).
(2) To spin stronger yarn from the same cotton quality, with the same or lower twist.
(3) To spin a yarn having the same strength as one spun on conventional systems by decreasing the twist rate.

However, it seems obscure as to whether the achievement of the same strength with 10% less twist is due wholly to decreased fibre breakage or whether an improvement in orientation of fibres contributes to this.

Indarte[4] has shown that curves of irregularity against flume setting for different drafts, twists and qualities all have the same general shape, showing a fall to a minimum and then a rise again with flume setting. This points to the fact that if the flume is not set near enough there is insufficient fibre control due to the decrease in the degree of fibre control in the front zone. On the other hand, if the flume is set too close there is excessive control which means that the fibres are only removed with difficulty.

It is also shown that for a fixed flume setting, there is a draft, or rather a range of drafts, which produce a more regular yarn than the others. The best draft for 64s warp tops appears to be in the range 100–150 when spinning at 0·5 in. to 0·6 in. flume settings, and 100–125 for 0·7 in. to 0·9 in. flume settings, or, in other words, the range of draft giving the minimum yarn irregularity decreases as the flume setting increases.

Townend and Yu[6] examined the effect of the draft on the end breakage rate when spinning by the conventional system. The drafts employed, spinning a constant count, were from 10 to 38. The end breakage rate increased but at the same time there was a change in yarn irregularity from 25% to 33%. Ambler "Superdraft" yarns spun at varying drafts, do not show such a change in the C.V.% of the yarn and the end breakage rate increases much more slowly. For the same quality and count, changes of ± 15% in the roving twist had no effect on yarn irregularity for a wide series of drafts and flume settings.

It appears that the best spinning conditions obtain when the spinning atmosphere has a temperature of 65–70°F. and a relative humidity of 50–55%. A relative humidity of 70% and over causes condensation on the top roller covers and reduces their drafting performance. At 80% and over spinning is quite impossible. Provided that the Lissapol emulsion is used, spinning with good results is possible down to 40% relative humidity.

References

(1) D. M. Hannah. Wool Science Rev. No. 15.
(2) J. Downs. "Textile Mercury," Vol cxxxi, No. 3416 : 561.
(3) D. M. Hannah. J.T.I., 1951, 42, P. 246.
(4) R. A. Indaste, M.Sc. Thesis. Leeds University. 1955.
(5) J. Noguera. "Modern Drafting." Casablancas High Draft Co. Ltd. 1937.
(6) P. P. Townend and L. T. Yu. J.T.I., 1953 44, T.363.

(*To be continued*)

Fabric Development

IN considering the development of fabrics incorporating the new fibres, although the initial work was often done by the fibre producer, there was normally no secret surrounding this development, said Mr. R. Mitchell (Brook Mill (Leyland) Ltd.), in a recent address to the Yorkshire Section of the Textile Institute. On the contrary they often sought the co-operation of spinning and manufacturing concerns to help in the initial stages of spinning and weaving trial yarns. It was only by such close co-operation by the various branches of the industry that development work could be carried out smoothly and efficiently. Discussing first the position of the fibre producer, Mr. Mitchell spoke of the degree of advertising and publicity, and observed that the power of advertising could readily be illustrated by the recent developments in the worsted/"Terylene" cloths.

It was safe to assume that many of the newer synthetics would eventually find their rightful and most useful place in the field of fabrics in the same way that viscose rayon had done, continued Mr. Mitchell. There was naturally a tremendous struggle between the fibres to keep their places, and technologists whose interests were in the survival of the natural fibres were constantly battling against the ever-increasing threat of the synthetic fibres. They could not afford to sit back, however, in the belief that there always had been, and always would be, a market for the natural fibres.

Reviewing the position of the manufacturer in respect of fabric development, Mr. Mitchell said that generally speaking there was the work which was carried out at the request of the customer on the one hand, and speculative development where fabrics were produced in keeping with market trends and in which it was hoped to interest the customer on the other. In the first case it was known that there was an interest in the fabric and the major considerations would be the standard of the material, its price and performance compared with other fabrics of a similar nature and end use. In the second one, where it was a question of speculative development from a new fibre or blend, many manufacturers worked in co-operation with the fibre producer to produce a fabric with a particular end use in mind. The manufacturer might, however, develop fabrics of his own construction without any lead or help from the development technologists of the fibre producer. But whatever the method of development it must be carried out with an eye to the needs of the public, and one to the price at which it was thought the fabric would sell.

Referring to minimum-iron shirting fabrics, Mr. Mitchell said provided the garments were treated with normal care and laundered with reasonable care, the minimum-iron properties were fairly permanent. Maltreatment of the garment might, however, break down the bond between the resin and the fibre, which would destroy the crease recovery properties of the cloth. In order to improve the durability of these properties, work was at present being carried out in which the yarn itself was impregnated with resin before weaving. It was claimed that this method allowed a better penetration of the yarn, and therefore a more satisfactory garment.

Automatic Smoke Indication and Control

Increasing use is being made of electronic devices to indicate flue-gas density, give warning of unsatisfactory conditions, and to operate flue-gas density recorders and combustion control gear

By "ENGINEER-IN-CHARGE"

IN these days of high fuel costs there is every inducement to operate boiler plant efficiently by ensuring complete combustion of the fuel. As is well known a good guide to the state of combustion can be obtained by considering the density of the flue gases, dense smoke indicating an inadequate supply of air to the furnace, whilst a very light flue gas may indicate that excessive heat is being carried away due to excessive air being supplied. Various types of smoke density indicators have been on the market for many years and electronic devices are now being used to indicate flue-gas density, give warning of unsatisfactory conditions, and to operate flue-gas density recorders and combustion control gear.

Photo-electric Cell Circuit

Many such instruments utilise a photo-electric cell to receive light which is passed across the stack through the flue gases, and are based on the fact that the flow of electrons from the cathode of such a cell to its anode depends on the amount of light which falls on the anode. Fig. 1 shows the variation of anode current through a vacuum photo-electric cell with various values of light, when a given voltage is applied to the cell.

Fig. 2 shows the connections of one device which indicates the density of the flue gases and gives warning of faulty conditions. The lamp A is fed from the a.c. supply through the variable resistor R_1 which is used to adjust the strength of the light from A to the required value. The light from this lamp is directed by means of a lens on to the photo-electric cell B through the flue gases. The cathode of the vacuum triode valve C is heated by electrons which flow from the a.c. supply through the resistors R_2, R_3 and R_4, the variable resistor R_3 being used to adjust the cathode temperature to a value at which the valve C has sufficient sensitivity.

The polarity of the a.c. supply reverses twice in each a.c. cycle but, for the purpose of explanation, we will first consider the conditions during the half cycles when the supply terminal X is positive to Y, which we will term the positive half cycles. Electrons will then flow through the cathode heater circuit of C from negative to positive as indicated by the arrows. Provided that the flue gases are not too dense the light from A will then reach B, and will allow electrons to pass from the negative terminal Y through the left-hand side of the potentiometer resistor R_5 from S to T, and through the photo-electric cell B from cathode to anode, returning to the positive terminal X.

Due to this electron flow the polarity of the moving contact T of the potentiometer resistor R_5 will be higher than that of S; reducing the negative bias on the grid of the valve C. Electrons will then flow from the cathode to the anode of the valve C, passing from the negative terminal Y through R_2, through the gauges D_1 and D_2, and through the relay coils E_1 and E_2 to the positive terminal X as indicated by the arrows. The set is adjusted so that with smoke density which gives the highest combustion efficiency the pointers of D_1 and D_2 are at their mid-positions. Under these conditions the electrons (current) through the relay coil E_1 are insufficient to close the contacts M, but the relay coil E_2 can hold the contacts F-H in the closed position.

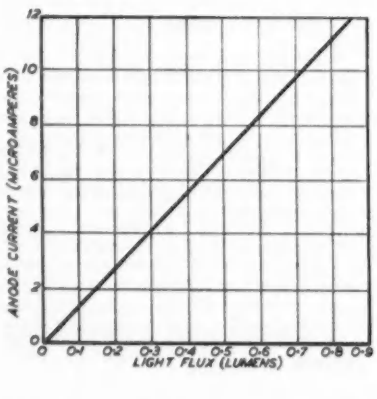


Fig. 1 (left). Relation between current and light on a vacuum photocell on a given voltage

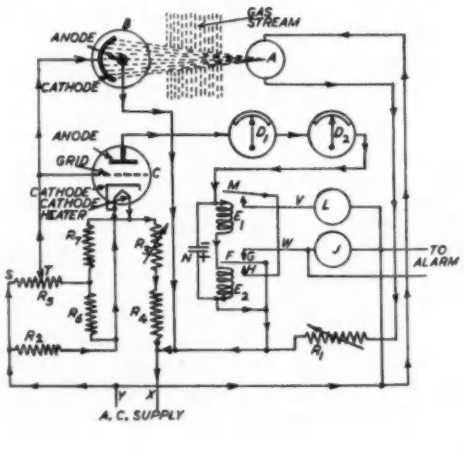


Fig. 2 (right). Stack-haze density indicator circuit with photoelectric cell and amplifying valve

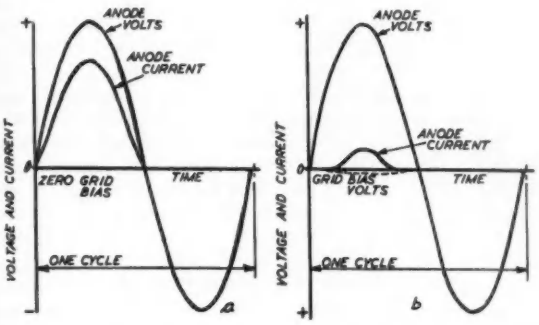


Fig. 3. Relation between anode volts and current of a vacuum triode valve

Under these conditions neither the red lamp J nor the green lamp L will light.

Amplification of P.E. Cell Output

Electrons can only flow from the heated cathode of the valve C to its anode, and not vice versa, and can only flow when the anode of C is at a sufficiently higher potential (voltage) than that of the cathode. Thus electron flow through C only occurs during the positive half cycles. During these half cycles the electron flow can also be limited or prevented by applying a sufficiently high negative bias to the grid of C. Thus increased light falling on the photo-electric cell increases the current through C by reducing the negative grid bias. Fig. 3a shows the anode current through a vacuum triode valve when a.c. is applied between its anode and cathode, with no grid bias. The current through C thus flows for no more than half of each a.c. cycle, but the meters D_1 and D_2 are damped to respond to the average current.

During the conducting periods of the valve C the electrons pass partly through the relay coils E_1 and E_2, and partly accumulate on the negative plates of the capacitor N; at the same time electrons are drawn from the positive plates of N to the positive terminal X. As the capacitor N becomes charged the potential difference between its plates rises. As the electronic emission from C falls the electrons on the capacitor N discharge through the relay coils E_1 and E_2, maintaining a flow of electrons through these coils during the negative half cycles. This process continues until the capacitor N is discharged, as occurs when electronic emmision through C is prevented during the positive half cycles also. In this way chatter of the relay coils E_1 and E_2 is prevented.

In the event of increase of smoke density the electron flow through the photo-electric cell is diminished, thus increasing the negative bias on the grid of the valve C. Fig. 3b shows that negative bias on C reduces the electron current through C during the positive half cycles, causing the meters D_1 and D_2 to indicate the altered conditions. If the density becomes very great the electron current is reduced to such a degree that the relay coil E_2 releases its armature the contacts F-G will then close to illuminate the red lamp J and to energise the alarm circuit.

Effect of Excess Air Supply to the Furnace

On the other hand if excessive air is supplied to the furnace the haze density decreases below the satisfactory value; more light from the lamp A reaches B with increase of electron flow from the cathode of B to its anode and from S to T during the positive half cycles. The reduced negative grid bias on C increases the anode current through the meters D_1 and D_2. The increased current through the relay coil E_1 causes it to close the contacts M to illuminate the green lamp L. Thus the red lamp indicates lack of air, and the green lamp excessive air. If required the points V and W can be connected to two electro-magnets of a control device, with the common point of the two electro-magnets connected to Y. This device can be used to control a small motor used to operate the pen-actuating mechanism of an operation recorder which will chart the times of faulty combustion. It could also be used to control a small damper motor to keep the smoke density within the required limits automatically.

Dual-Element Valve Circuit

Fig. 4 shows another circuit in which a dual-element vacuum triode valve V is employed. The a.c. supply is applied to the transformer T_2 through the voltage-stabilizing tube K, and to the transformer T_1 through K and the variable resistor R_1. The stabilizer tube K contains a tungsten filament; in the event of increased current through the tube due to increase of supply voltage or other cause the resistance of the filament increases, with increased volt drop across the tube. As a result the voltage applied to the transformer T_2 and other parts of the circuit is maintained almost at a constant virtual value; thus avoiding faulty operation due to change of light value from the lamp E etc. The secondary windings of T_2 supply the heating current for the cathodes of V.

With normal flue gas density light from E reaches the photo-electric cell D, and electrons flow from the cathode of D to its anode during the positive half cycles when X is positive to Y. These electrons pass from Y through K and R_2 to the positive terminal X, as indicated. These electrons charge the capacitor H_1 with the polarity indicated during the positive half cycles, giving the grid G_1 of the valve V a negative bias through the variable resistor R_4. This negative grid bias is maintained during the negative half cycles by the capacitor

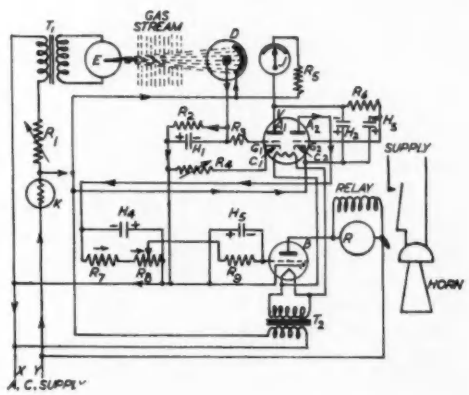


Fig. 4. Smoke density indicator with thyratron] valve

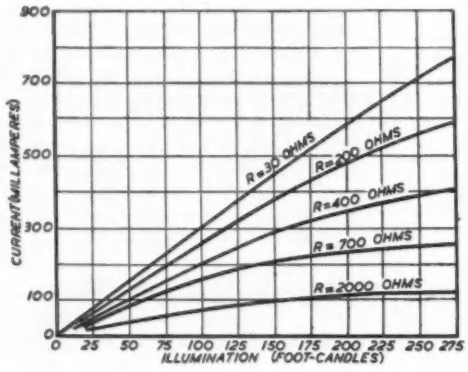


Fig. 5. Output current from a selenium cell with various values of external resistance

H_1 so long as the photo-electric cell D conducts during the positive half cycles.

During the negative half cycles, when Y is positive to X, a small electron current then occurs from X through R_4, from cathode C_1 to anode A_1 of the valve V, through the smoke-density indicator J, resistor R_5, stabilizer K, and returns to the positive terminal Y. If required a smoke-density recorder can also be connected in series with J. The electron flow through R_5 causes the grid G_2 to have a negative bias due to the circuit J and R_5 being in parallel with the resistor R_6 and capacitor H_3. The grid bias on G_2 thus depends on the charge on the capacitor H_3. Electron flow from C_1 to A_1 charges the capacitor H_2 as well as H_3, thus maintaining the small negative bias on G_2 as long as there is electron flow from C_1 to A_1 during the positive half cycles.

During the positive half cycles during which light falls on D to maintain only the small negative bias on G_2 electrons will also flow from Y through K and through V from C_2 to A_2, passing through R_7 and R_8 to the positive terminal X. Whilst the negative bias on G_2 is low the anode current through A_2, R_7 and R_8 will be comparatively high; thus charging the capacitor H_4 to a relatively high potential. It will be seen that the capacitor H_4 applies a negative bias to the grid of the thyratron valve B through R_7, part of R_8, and R_9; charging the capacitor H_5 to the polarity shown. The capacitor H_5 thus applies negative bias to the grid of B as long as light falls on D during the positive half cycles. The negative bias on the grid of B prevents electrons passing from the cathode to anode of B. With normal smoke density the negative grid bias on B is thus maintained sufficiently high to prevent ionization of the gas in B during the negative half cycles and, of course, electrons cannot flow through the valve during the positive half cycles. Thus, whilst the smoke density remains within normal limits, there is no emission through B and neither the red lamp R nor the relay coil are energised.

Operation of Thyratron as a Relay

In the event of excessive smoke density due to lack of air for combustion the light falling on D is reduced. The reduced electronic emission through the photo-electric cell D during the positive half cycles then causes reduction of the negative grid bias on G_1. Increased current then flows through the smoke-indicator meter J, and recorder if fitted, and also through R_5, increasing the negative bias on G_2. There will then be reduced emission from C_2 to A_2 during the positive half cycles. In consequence the volt drop across the capacitor H_4 is reduced with reduced negative bias on the grid of the thyratron valve B. With a certain increase of smoke density the reduction of negative bias on B allows electrons to start to flow from the cathode to anode through B during the negative half cycles. Ionization of the gas in B occurs so that electron current continues at a high value during the remainder of the negative half cycles, unless the negative bias on the grid of B is increased. The thyratron B thus acts as a relay, dense gas causing emission from the cathode to anode of B to light the red lamp R and energise the relay coil to operate the horn. When the flue gas density is reduced to normal again the increased negative bias on the grid of B stops the tube conducting, extinguishing the red lamp R and switching off the horn.

No alarm is given in the event of the smoke density falling to a very low value due to excessive air being supplied to the furnace. However the increased light falling on the photo-electric cell D increases the negative bias on the grid G_1 to reduce the current through the smoke-density indicator J, and the density recorder if fitted, to give a visual indication of the faulty conditions.

Photo-voltaic Cell Circuit

Photo-voltaic cells are used in some smoke-density indicators and combustion controls. This type of cell has a selenium plate or disc, and a low voltage is generated in the cell when light falls upon it, which can be used to pass current through an external circuit. In this way light energy is converted into electrical energy. Fig. 5 shows the characteristics of one selenium-iron cell. It will be noted that when connected to an external circuit of suitable resistance the current output can be made practically proportional to the amount of light falling on to the cell.

One type of smoke-density recording device has a light unit which throws a beam of light through a focussing reflector on to a selenium cell M, as in Fig. 6, which is used for light measurement; the output of this cell varying according to the density of the flue gases. Light is also reflected from the light unit directly on to a second selenium cell R used as a reference cell; the output of this cell is constant when the light unit

(*continued on page 139*)

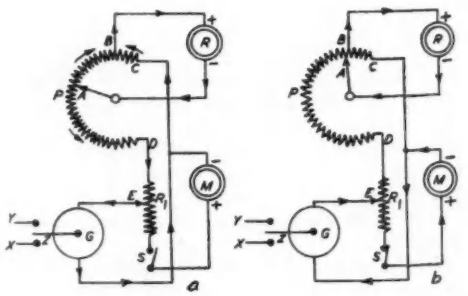


Fig. 6. Connections of photo-voltaic cells in a smoke-density recorder

Silk: Medium and Heavy Plain Weave

Brief descriptions, including ends, picks and direction of yarn twist in poplins, taffetas, crepes, grandrelle stripes, grosgrains, dupions, moires, crepe-de-chines and other silk and rayon specialities

By W. MIDDLEBROOK*

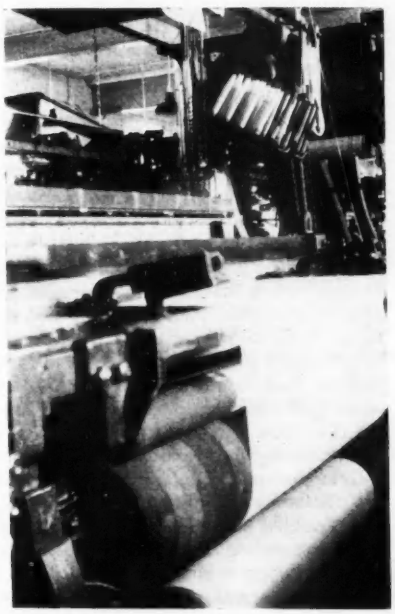
BURATINE is a silk poplin, a fabric where slight ribs are formed through a preponderance of warp over weft; one example has 160 ends per inch and 80 picks. Another fine poplin, where the ends double the picks, is *helvetia*, with a grège silk warp and schappe silk weft, raw silk and spun silk respectively; the name indicates that the fabric originated in Switzerland. *Marceline* is a light silk poplin with a special finish for hats, and *poult de soie* is a dress fabric of net silk in the poplin style, with two-fold organzine warp and tram weft. *Pou(l)t de soie* or *pou de soie* was also called *paduasoy* or *padesoy* in the 18th century, when it was a heavy corded silk material for women's dresses and men's suits; the name is believed to be a corruption of *Padua*, in Italy, and *soie*, or silk. With reference to the organzine and tram yarns used in *poult de soie*, organzine is a two or three thread silk yarn with, for example, a "Z" twist of 16 turns doubled with an "S" twist of 14 turns; tram is a soft silk yarn of raw silk threads twisted together with few turns. The actual meaning behind the name *poult de soie* is anybody's guess, unless the fabric is likened to the breast of a plucked fowl, *poult* meaning a chicken; there is another silk fabric with a dobby weave that gives it a pebbled surface similar to chicken skin, called *poult de la reine*.

Taffeta mousselin, or *muslin taffeta*, is a fine silk with the picks doubled by the ends per inch, and another fine light-weight silk taffeta is called *Mikado*, one quality being 92×46, 100 den. yarns; the name *taffeta* springs from the Persian *taftah*, meaning "to spin." *Lustrine* is a lustrous silk taffeta 180×100, used as a lining; the word *lustrine* is French for glazed cambric or lining. Another fine silk fabric of the same group is *chiffon taffeta*. *Batiste silk* can be classed as a light taffeta, a dress fabric of 75 den. yarns, 100×120.

Altesse and *Albert crepe* are fine dress fabrics made with crepe weft; *altesse* means "highness" as applied to a sultan. *Peau de souris*, or *mouse skin* is a soft-finished silk fabric. *Cora cloth* is a plain silk woven in light shades with schappe yarns, while *cleaning cloths* are of spun silk with either a plain or a leno weave, *leno* meaning "pliant, supple." *Balloon cloth* may be of silk, cotton or flax, and is very closely woven; it is used for aircraft coverings, wind socks, shirts and dress goods, and waterproof fabrics.

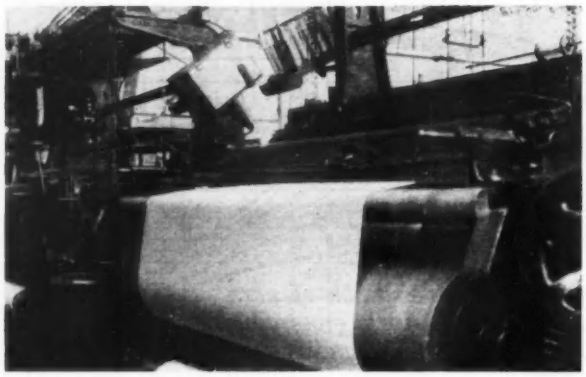
Handkerchiefs are made from *Barcelona*, coloured silk squares of about 20 ins.; also *bandanna*, which originally came from India as a bright-coloured silk or cotton, the name meaning "to bind or tie." The good ladies have a name for *bonne femme*, a plain silk fabric with a fine warp and coarse weft, used for scarves. A tie-making fabric with grège silk warp and silk or rayon weft is called *Royal*, while *bombazine*, an all-silk fabric of solid black that has been used for mourning, was first made in Norwich nearly 400 years ago; the name *bombazine* is a derivative of *bombyx*, a silk worm.

Colour is evident in *pekin stripes*, with different coloured stripes of the same width; in the days of the Napoleonic wars trousers of *pekin* were a feature of civilian dress, and the term "pekin" was applied to civilians by the soldiers. *Pyjama stripes*, usually of spun crepe, are noted for colour, and *pencil stripes* have fine dotted stripes made by single silk threads of a different colour to the body of the warp. Colourful also is *changeant*, an all-silk fabric with a shot effect from differently coloured warp and weft; the French



Silk handkerchief fabric

* *Brocklehurst-Whiston Amalgamated Ltd.*



Silk print fabric

changeant means "shot or changeable." Stripes can also be made by introducing different warp yarns to a silk fabric, such as grandrelle bouclé yarns. One example of the latter is a spun silk of plain weave, with the ground beam of white spun silk and an extra stripe beam of bouclé fleck and spun, 2/60s, with 100 picks per inch of silk crepe weft. Plucked dents in the reed allow for the safe passage of the bouclé yarn, which is an imitation astrakhan, with knots and loops incorporated in the yarn; *bouclé* is French for "buckled."

An example of a spun silk *grandrelle stripe* is 34 ins. wide, with 4,000 ends of 2/60s spun silk and 500 ends of colour-and-white grandrelle with five turns per inch. Crepe silk weft is used, 56 den. "S" twist and 70 den. "Z" twist, with 112 picks per inch; it is important that the cord roll of grandrelle yarn is not weighted too heavily, or the grandrelle is liable to untwist. *Jasper* has a black silk warp with white weft, giving a pepper and salt mixture that gives rise to the name, being an imitation marble; *jasper* means "to marble or sprinkle." *Bourette* is a clothing fabric made with a coarse reed and silk waste yarns, the name springing from *bourre*, meaning silk floss. *Pongée* is made from gummed silk, one quality being 80×80, 26 den. warp and 90 den. weft. The original *pongée* was of soft, unbleached Chinese silk, from the wild silk worm reared on oak leaves, and the name probably springs from the Chinese *pun-chi*, "own loom," or *pun-chen*, "own weaving."

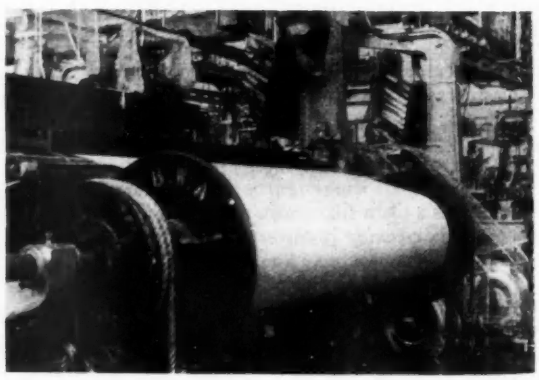
Heavy Plain Silks

The majority of silk *taffetas* are heavy fabrics, one example being 200 ends of organzine and 100 picks of tram to the inch. Another example of a *heavy taffeta* has 110 ends of 20/22 den. four-thread per inch, equalling 440 Cyprus singles, and 112 picks of 75 den. China tram per inch. Such a fabric is best woven in a tappet loom, with the ends entered on six shafts; if a dobby shedding motion has to be used it is a good idea to couple two dobby jacks to each heald shaft, to spread the load and prevent breakages. A lot of weight has to be applied to the warp beam to get the picks in, and to make a smooth cloth free from "spangle," while good rubber-rollered temples are required to hold out the fabric and ease the strain on the reed at the sides. *Chameleon taffeta* is really a fine dress poplin with the warp double the weft, one example being 96×48, 2/80s warp and 2/60s weft. The warp is one colour and the weft yarn doubled of two colours, the resultant fabric changing colour according to the light with a "chameleon" effect. *Papilion taffeta* is a net-silk fabric used for underclothing, the English translation being "butterfly taffeta." *Radium taffeta* is a silk dress fabric of light colours and a hard-twist weft; really a high-class poplin, 400×100, 26 den.

Taffeta boyauz is made in check designs. *Taffetas broché* is a plain fabric of bright colours used for embroidery—"brocaded taffeta." *Chagrin taffeta*, used for drapery and linings, is dotted in many colours to resemble *shagreen*, or leather. A really expensive taffeta with a printed silk warp is *taffetas chine* or *Chinese taffeta*, while *taffetas crepe*, as the name implies, is made with hard-twisted crepe weft. At the other end of the scale is an inferior taffeta of single yarns, 72×78, called *Taffeta de Florence*; the French *Florence* is another name for *sarcenet*. *Taffetas glacé* has a shot effect by the weft being of a different colour to the warp; *glacé* means "shot." One quality is 180×92 with a two-fold warp and 13/15 den. four-thread tram weft. *Taffeta lining* is an expensive fabric for ladies' dress linings, 200×70, with a fine warp and coarse weft. *Taffeta lustre* is a silk poplin finished with a high lustre. A soft-finished, piece-dyed fabric is *taffeta souplesse*, or *supple* taffeta, while *taffetaline* is made for dress and skirt linings from schappe waste silk.

Sillon silk is a dress fabric with furrows across the piece caused by the insertion of thick cotton weft at intervals, four or six picks in a shed; *sillon* means "furrow." *Pongée impérial* is a plain, heavy silk fabric; another heavy fabric is *moline*, with a spun silk warp and tram weft. Spun silk is also used in *flannelle de soie*, or "silk flannel," 110×80, 60 den. two-thread warp and 60 den. singles weft, with a lustreless finish for ladies' summer wear. *Armozeen* is a heavy taffeta or poplin of solid black, used for the clergy in France; also for hat bands and mourning bands; another heavy taffeta is *Armourclad*, the trade name of a strong fabric made from doubled yarns. *Armazine*, probably so-named from the French *Armozeen*, was an English fabric of strong, corded silk used for ladies' gowns and men's waistcoats from the reign of Elizabeth I to George III, after which it was used for scholastic gowns. *Parachute cloth* can be of silk or of nylon, plain weave or twill; it is not a heavy cloth, but must stand up to certain porosity tests and made without the aid of temples; this is accomplished by shedding late and having as little drag as possible on the weft. One quality of plain weave Parachute fabric uses 20/22 den. three-thread warp and 63 den. tram weft, 100×100 per inch.

Grosgrain, or *coarse grain*, is a plain weave silk fabric that gave the name *grogram* to an old-fashioned dress and cloak fabric; it was an Admiral of the British Navy, nicknamed *Grogram* because he used to favour a grogram cloak, who caused the daily rum issue to be mixed with water,



Spun silk warp

a mixture that has been called "grog" by naval personnel to this day. *Grogram* was really a French type of *camelot*, being a mixture fabric of silk/mohair or silk/wool. There is quite a range of plain silk fabrics of the *gros* type, including *gros de Naples*, *gros de Tours*, *gros des Indes*, *gros de Suise*, *gros de Chine*, *gros Noble* or *gros d'Orleans* and others.

Écossaise, the French term for "Scottish," is a plain silk dress fabric in the tartan style. The term *dupion* is often seen nowadays as a description of a nylon fabric, but the term *dupion*, which means "double," refers to double cocoons formed by two or more silk-worms, and *dupion* weft is a silk yarn with slubs; this has given rise to the practice of calling rayon or nylon plain fabrics, woven with slub weft, *dupions*. Another rough and slubby fabric with a plain weave is the silk *tussore*, made from a strong, coarse, fawn-coloured silk from oak-feeding as distinct from mulberry-feeding silk-worms. Cotton *tussores* are also made with mercerised warp yarns and coarse weft, a dress fabric that is an imitation of the real thing. The word *tussore* is from the Sanskrit *tassara*, meaning "shuttle." The fabric is usually made with the warp and weft yarns the same, and one example is a tussore/rayon mixture yarn equalling 2/30s spun counts, a lightly-weighted plain fabric with 50 ends and picks per inch. The cloth needs to be well-templed, and the rough, fibrous weft does not require any wool tuft in the eye of the shuttle.

A watered silk fabric is called a *moiré*, though this was originally a watered *mohair* fabric. *Moiré antique*, for example, is a heavy watered silk, the "watered" effect being obtained by passing the cloth between specially engraved pressure rollers. The Arabic *mukhayyar*, from which come the terms *mohair* and *moiré*, means a rough cloth of goat's hair. *Tabby silk* was originally a fabric with a watered surface, the name springing from the Latin *attābi* and the Arabic *attābiy*, the name of the quarter of Baghdad where the fabric was made; a *tabby* cat has "watered" markings on its fur. *Tabby silk* was a plain weave fabric, and the name has since been used to describe any silk cloth with a plain or "tabby" weave. Cloths with a similar name are *tabaret*, *tabinet* and *tobine*, *tabaret* being a fabric with alternate stripes of satin and of watered silk, used chiefly for upholstery. *Tabinet* is a watered fabric of silk and wool used for window curtains, etc., and some maintain that this is a trade name suggested by the French *tabis* or tabby, though the French themselves declare that the fabric was named after M. Tabinet, a French refugee who settled in Ireland and there manufactured the cloth. *Tobine* is not a plain weave, but is a stout twilled silk dress material referred to by the French as *tabis*.

Silk prints are mostly twill weave, with net silk warp and soft spun or schappe silk weft, but some are made with a plain weave, one example being 100×70, 36 ins. wide, used for dress materials, draperies, head squares and the like, these silks being soft and light, though strong. A silk print called *pompadour*, after the famous Madame de Pompadour, has dainty floral patterns printed on the warp. The type of yarn often used in *silk prints* is a warp of 20/22 den. net silk singles, three-thread or three ends as one, and 2/40s spun silk weft.

Spun silk crepes are plain fabrics, with spun silk warp and crepe silk weft, "S" and "Z" twist, and they may be solid colours, ivory crepes or stripes and checks. One example of a solid colour *spun crepe* is 36 ins. wide, with 96 ends per inch of 2/60s spun silk, and 96 picks per inch of 56 den. crepe yarns.

AUTOMATIC SMOKE INDICATION

(*continued from page* 146)

gives a constant light, and the circuit resistance is constant.

The measuring cell M is connected through a switch S and a resistor R_1 to the ends of a potentiometer C-D and thus applies a varying voltage between C and D under varying light conditions. The reference cell R is connected between a fixed point B and the moving contact A of the potentiometer; the moving contact being coupled to a small motor which also moves the pen of the smoke-density recorder.

When the switch S is open, as in Fig. 6a, the measuring cell M applies no voltage to the potentiometer; these conditions being equivalent to maximum smoke density. The reference cell R then passes electrons from its negative terminal to A and through the potentiometer to B; it also passes electrons through the potentiometer from A to D, through part of the resistor R_1, through the contact-making galvanometer G, and through the potentiometer resistor from C to B. The galvanometer then closes the contacts Z-X, which energise the motor of the recorder pen to move it towards the maximum smoke density position, and also move the contact A towards B. As A reaches B the current through the galvanometer G is reduced. Thus as the recorder pen reaches the maximum density position the contacts Z-X open to stop the motor.

When the switch S is closed, as in Fig. 6b, the current through the galvanometer G is then largely due to the measuring cell M. If there is a low smoke density the cell M will then pass a comparatively high current through G in the opposite direction to before, causing the contacts Z-Y to close to energise the motor to move the recorder pen to the low-density position. At the same time the contact A is moved towards D to apply an increasing opposing voltage from R to the galvanometer G. As the contact A reaches a certain position, depending on the smoke density, the current through the galvanometer ceases and the contacts Z-Y open to stop the motor.

If, with the switch S closed, the smoke density increases to reduce the voltage applied to G by the measuring cell M below that applied by the reference cell R the latter will then pass current through the galvanometer in the opposite direction closing the contacts Z-X. The recorder pen is thus moved towards the high-density position and A is moved towards B. The contacts open when the potentiometer has reduced the voltage applied to G from R to the same value as that applied from M. In this way the recorder gives a continuous record of variations of the smoke density outside certain limits. The resistor R_1 may be used to adjust the position of the recorder pen on the chart for minimum smoke density conditions. If required the recorder can be fitted with contacts to operate a signal lamp and bell to give warning of unsatisfactory combustion conditions.

Similar types of apparatus have been used to control, as well as indicate, the smoke density. For instance the contacts Z-Y-X may be used to control a reversible motor which operates a damper to govern the air flow into the furnace.

Production and Uses of Bulked and Crimped Yarns*

Crimped yarns will extend considerably under low loads and return quickly to their original length when the load is removed

By G. SHEPPARD†

DURING the past decade the textile trade has witnessed the remarkable development of a number of modified continuous filament yarns which may be grouped under a general heading of "bulked" and "crimped" yarns. By virtue of their unique character, these yarns have established themselves in the apparel fabric field, especially as knitting yarns. The most obvious feature of bulked yarns is the bulky, voluminous nature when observed in a relaxed state. Crimped yarns also have this intrinsic property when relaxed, but also have a further virtue in being able to extend many times their own length under very low loads and on removal of the load to return quickly to their original length.

Conventional Crimped Yarn

The modified continuous filament yarn is produced by subjecting a thermo-plastic multi-filament fibre to a sequence of twisting, heat setting, untwisting operations, a technique which causes the individual filaments of the c.f. yarns to become crimped and to possess a high degree of torque. When orthodox throwster equipment is employed in the manufacture of this type of yarn the resultant product is now generally termed "conventional" crimped yarn. Crimped nylon yarn produced by the twisting, heat setting, untwisting principle first found prominence in the half-hose trade but experimentation in other knitting fields, including foundation and outerwear garments and again, as in the hosiery field, gave results beyond expectation and created an ever increasing demand for this type yarn. For the first time, soft, resilient, bulky fabrics having a distinctive handle of their own could be made from fine denier continuous multifilament nylon yarn and furthermore, because of their resultant bulky nature air was entrapped in the fabric structure thus making the fabrics warmer in wear.

The crimp effect is achieved by inserting a very high crepe twist in the thermo-plastic multifilament fibre and then subjecting the highly twisted yarn (in package form) to steam conditions similar to the final setting temperature of the ultimate fabric thereby ensuring that the crimp effect is permanently set. (30 den. yarn will have 90/100 turns per inch inserted and is then set at approximately 270°F.) After conditioning, the twist is removed by detwisting to zero twist. As these yarns are highly twist-lively, yarns of opposite twist must be produced so that a non-lively yarn may be obtained by folding together yarns of opposing torque, thus preventing any tendency for spiralling in the ultimate fabric.

For 30 den., as mentioned above, it is found that 90/100 t.p.i. must first be inserted in the yarn and subsequently removed. This entails a total twist operation of 180/200 t.p.i. and as unit productivity is directly related to total twist inserted it will readily be seen that unit output using this technique has to be extremely low. In fact the output per spindle using 30 den. is some 3·5 oz. per week of 168 hours.

It is unlikely that the large potential demand for crimped yarn could have been met by orthodox throwster equipment only for, as mentioned earlier, yarn output is directly related to twist inserted in the yarn and to the spindle speed of the twisting process. It was this vital productivity factor coupled with yarn production costs which stimulated yarn research on alternative methods of producing yarn having bulk and high extension and recovery properties and it was as a direct result of this that false twist crimped yarn came into being.

False Twist Crimp Yarns

The principle of false twisting is not new for it was suggested more than 20 years ago in a British patent which dealt with the treatment of acetate rayon yarns. Recent adaptation of this false twisting device has made an outstanding contribution to the crimped yarn field inasmuch as its introduction has achieved at least a five-fold increase in unit productivity by condensing the three separate operations of twisting, heat setting, untwisting of the conventional crimp yarn process into one continuous operation.

The false twist spindle has not to accommodate a package of yarn during twisting and it can be made to operate at phenomenally high rotational speed (30,000 r.p.m. is now quite common). The spindle consists of a plain hollow tube through which the yarn passes and having a device fitted to one of its open ends which when rotated causes twist to be inserted in the yarn at the input side of the tube and to remove the twist in the yarn as it leaves the device. The thermo-plastic multifilament yarn in its passage through the false twist system is given a high temperature set in its high twist state, resulting in the yarn having a high degree of torque when de-twisted and also bulk when relaxed.

Fundamentally, conventional and false twist crimped yarns are the same in that both are prepared by the twisting, heat setting, untwisting sequence of operations, and since they have the same basic yarn character, they share the same end uses. Whilst methods were being sought to streamline the production of conventional crimped yarn, extensive research was progressing along other lines of continuous filament yarn bulking and as a result a number of new bulking techniques simultaneously emerged which have since achieved notable commercial success. Of these the three most notable are (*a*)"Ban-Lon," (*b*) "Taslan" textured and (*c*) "Agilon" yarns.

"Ban-Lon"

"Ban-Lon" is the trade name given to the yarn produced by the bulking process controlled by Joseph Bancroft and Co., U.S.A. It is a non-torque yarn, having moderate extension and recovery properties and bulk when in a relaxed state. It is produced by subjecting thermo-plastic continuous multifilament low twist yarn through a compression chamber or "stuffer box" where the crimping and heat setting is carried out in one continuous operation. This technique imparts to the individual filaments of the yarn a permanent wave-like crimp. This can be varied as desired.

One notable difference between this and the two yarns previously described. It is a non-torque yarn and requires no special handling technique in subsequent operations. The crimp formation in "Ban-Lon" is also different from that in the yarns already mentioned it being wave-like in character and not helical and twist lively as is the case with conventional and false twist crimp yarns.

"Taslan" Textured Yarn

Reverting for a moment to the three modified continuous filament yarns already described, one will observe that each requires thermo-plastic properties of the parent yarn to achieve a permanence of crimp. Furthermore, each possesses high extension and recovery properties and complete absence of bulk, in yarn form, when fully extended. The high extension and recovery properties make these yarns ideally suited to knitting because the open structure of knitted fabrics allow full advantage to be taken of the elastic

* *From a recent paper to Hinckley Textile Society.*

† *British Nylon Spinners Ltd., Pontypool.*

properties of the yarn. This elastic feature, however, although advantageous for knitting does in fact constitute a drawback in weaving for it is generally accepted that a very important characteristic of most woven fabrics is their dimensional stability in both warp and weft directions achieved, to a large extent, by weaving yarns of a low extensible nature.

The advantages to be gained from bulked continuous filament yarns in woven fabrics were not overlooked and to this end the du Pont Company of America promoted a technique whereby continuous multi-filament yarns, whether thermo-plastic or not, could be bulked by subjecting the c.f. yarn to the turbulence of high velocity air. The effect of air turbulence on the yarn causes the individual filaments of the yarn to become randomly displaced and locked in a looped crenellated configuration whilst still retaining the normal extension and recovery properties of the parent yarn. The size and frequency of the filaments loop formation can be varied at will to obtain a range of fabric handle approaching that of silk, wool or cotton. Yarns produced by this patented technique are called "Taslan" textured yarns and although they are predominantly weaving yarns they have also given pleasing results in the knitwear trade.

"Agilon"

The most recent of these modified continuous filament yarns is "Agilon," the trade name of nylon yarn produced by a technique evolved and patented by B.N.S. Ltd. Whereas the other bulking methods require a multifilament yarn to obtain effect, both monofil and multifilament yarns can be prepared by the "Agilon" process. "Agilon" is a non-torque yarn prepared by passing nylon c.f. yarn in a thermo-plastic condition over a sharp knife-like edge.

The bulk and elastic properties of the yarns, however, are not fully apparent until the fabrics are given a developing treatment which brings out the latent characteristics of the yarn which includes softness, warmth, covering power and subdued lustre. "Agilon" multifil is a loftly high extension yarn and, therefore, ideally suited to knitting but it has also produced very pleasing effects in woven constructions. "Agilon" monofil is also highly extensible and because of this stretch characteristic it has found a natural outlet in ladies' sheer hose.

Stretch Yarns

No survey of modified continuous filament yarns can be considered complete without mention of those yarns having only twist liveliness characteristics. These are primarily thermo-plastic monofilament yarns prepared by twisting, heat setting, untwisting, principle similar to that employed in the preparation of conventional crimp yarns. Prominence was given to these yarns in America where they were marketed as stocking yarns under the names of "Chadalon" and "Burmalised" yarns but of late many modified forms of these are in existence. These yarns have neither bulk nor high extension features; they possess only a high torque. The "stretch" characteristic imparted to the knitted hose is achieved by this high degree of torque in the yarn causing the loop or stitch structure of the stocking to collapse when the hose is in a relaxed condition. Because of the high degree of twist liveliness of these yarns special handling techniques are required and they must be knitted by the two carrier system of knitting.

Society of Dyers and Colourists

Shrink-Resistance of Wool

THE feltability of wool played a very important part in the production of "woollen," as distinct from "worsted" fabrics, the milled finish often being an integral part of the process. Even in the hosiery trade, use was made today of this important property of the wool fibre in the production of "cloth finish" fabrics, while a "milled finish" in hosiery fabrics was not unknown. But when the garments made from wool hosiery materials were to be washed frequently, the felting power of wool was a distinct disadvantage, said Mr. A. N. Davidson (Wool Industries Research Association) in a recent address to the Midlands Section of the Society of Dyers and Colourists. The fact that wool could be processed so that it lost its power to felt had been known for over a century, he continued, but attempts were still going on to produce the perfect process. Some background information in the work, which was not always appreciated even today, was considered and some of the side reactions that occurred were indicated. Three reasons for the shrinkage of wool and wool-mixture fabrics were dealt with briefly by the speaker:—

(1) Dutton's fundamental work on the influence of knitting in fabric stability was briefly reviewed. From this work it was apparent that the way in which fabrics were knitted, influenced not only their relaxation properties but also the way in which they reacted towards different shrink-resist processes. A very slackly knitted fabric would not only have little stability during soaking in soap solution in water, but would not give a good shrink-resist finish even after a heavy treatment, e.g. by chlorine. The behaviour of knitted fabrics during soaking was contrasted with that of woven fabrics, the relaxation properties of which had been shown to be influenced by the temperature and pH of the soaking solution, factors that were without effect in the relaxation of wool hosiery fabrics.

(2) The different processes used in finishing hosiery fabrics all played their part in the ultimate behaviour of the fabrics, a special case being that of fabrics knitted from shrink-resisting yarn or shrink-resist treated before scouring. In those cases complete consideration of the knitting structure did not always occur in the scouring process, but only took place when the fabrics or garments made from them were submitted to a more severe mechanical action, as in laundering of shrinkage testing. The shrinkage that then took place (usually in the length direction), without any felting of the wool might be considerable. It was possible, therefore, to make unfeltable wool fabrics that still shrank during laundering.

(3) The behaviour during laundering of a fabric made from a mixture (or blend) of wool and other fibres depended on the nature of the added fibres. Cotton, acetate, nylon and "Terylene" would all reduce the feltability of the fabric compared with a similar fabric made from 100% wool, while viscose rayon and regenerated protein fibres would increase the feltability. On applying a shrink-resist finish, however, it was found that less treatment was required for the mixture of blend than for 100% wool to produce the same degree of shrink-resistance.

It was pointed out that shrink-resist wool fabrics, or fabrics made from shrink-resist wool had other properties that were different from untreated wool, e.g. they might be printed: used in conjunction with untreated wool to produce tone-in-tone dyeing effects by piece dyeing methods: if completely non-felting, e.g. by the Chlorzyne process, as fillings for washable wool quilts, etc.

Reviewing the different methods used to produce a shrink-resisting finish, Mr. Davidson spoke of the way in which careful attention to detail could improve the quality of the wool produced: his remarks were exemplified by a calculation based on the acid uptake of wool at different pH values and the acid required to bring a hypochlorite solution to a known pH value. The approximate composition of a hypochlorite solution at different pH values were illustrated, thus enabling a user to treat wool under known conditions.

In conclusion, some experiments in the laboratories of W.I.R.A. leading to a new shrink-resisting finish were described. Using a very dilute solution containing peracetic acid and sodium hypochlorite, it had been shown that a high degree of unfeltability, a soft handle and a bleached finish might be obtained. As to concentration used, neither of the reagents alone had a substantial effect on the feltability of wool. The process was being used commercially on a fairly large scale in hosiery fabric and hose, while experiments under commercial conditions had given satisfactory results on a wide range of materials including garments (before and after dyeing); woven fabrics and blanket fabrics (milled and cellular). Small-scale work had indicated that a modified method of using the process gave excellent results on yarn and top (i.e. hank). Samples of materials processed by the new finish were exhibited during the lecture.

TEXTILE MACHINERY and MILL EQUIPMENT NEWS

Developments in Package Dyeing

Constructional features of a machine which is said to occupy less space than older types and enables safe, accurate dyeing with less maintenance

THE trend towards larger diameter cheeses, cones and beams, together with greater winding densities has made it necessary for dyeing apparatus to be designed to cope with this development. To obtain good or even better dyeing it has been necessary for dyeing machine manufacturers to increase the capacity of the pumps to ensure proper penetration, and it is now known that employment of a special turbine pump has enabled several disadvantages met with in older equipment to be successfully eliminated.

At the last German Industrial Exhibition in Hanover, B. Thies, Coesfeld, displayed a new type of dyeing machine known as a Turbo-Dyeing apparatus. This aroused considerable interest amongst experts in the trade and now that the makers are entirely satisfied with the design and efficiency of the machine, it is being offered on the British market. The firm point out that their axial pump has been developed especially for operation on dyeing machines, so that it will give great liquor quantities at high pressure. Furthermore, when reversing the motor this pump has been made to deliver the same quantities of liquor in the reverse direction. It is also stated that the hydraulic efficiency of this pump lies normally between 70 and 75%—the h.p. figures remaining the same, although an apparatus equipped with the new pump can cope with a greater quantity of liquor. The improved efficiency is obtained by the new design of pump, by omitting the four-way cock and abolishing the hydraulic resistance inside the four-way cock as well as reducing the number of pipes and bends necessary if liquor flow is to be reversed by mechanical means. It is claimed that a much better dyeing is possible and in many cases dyeing times can be reduced.

The turbo dyeing machine to which this pump is fitted by Thies is provided with a pressure regulating and pressure adjusting device, which allows the operation at a reduced liquor flow circulation in order to avoid bursting of beams. In this connection, it will be realised that owing to the parallel winding of the dye beams it is not so difficult to get evenness in the beams since the quantity of liquor need not be as great as for the dyeing of conical or cylindrical cross-wound packages.

The liquor flow need not be reduced when dyeing delicate yarn on beam when the turbo dyeing machine is used, as would be in the case of the old type dyeing machines with centrifugal pumps. The turbine pump has a reversing switch on the motor which stops the pump before the direction of the liquor flow is changed. In this manner, the new pressure in the reverse direction is gradually built-up and will avoid the shock treatment which could so easily burst a beam.

For some considerable time now a turbo dyeing apparatus has been working under specially severe conditions in the works of Thies and from the experience gained during this test it has been decided to equip all their range of dyeing apparatus, with the exception of the Universal machine Type A, with the new turbine pump and the same applies to the bucking and bleaching kiers of their Type B.

In the construction of the pump the latest developments in engineering technique have been used, the pump shaft rotating on anti-friction bearings and the shaft being equipped with slip ring packing, so that there is no maintenance of a stuffing box any more.

Stressing some of the advantages of the turbo dyeing apparatus compared to the old type apparatus, the makers emphasise that it occupies less space, is more certain of giving safe and accurate dyeing, its maintenance is less and the danger of bursting packages is considerably reduced. Incidentally, the new dyeing machines can be fitted with heat exchangers in

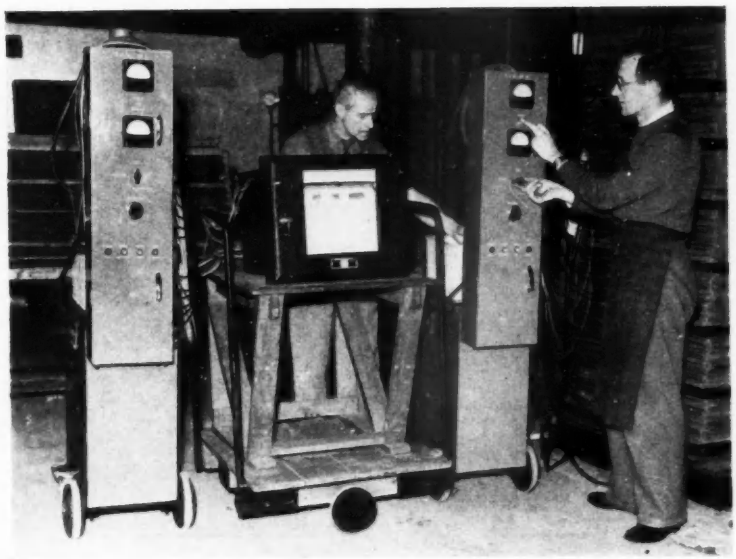
Thies turbo-dyeing machine

place of steam coils or direct steam injection.

In drawing attention to this the firm state that steam injection will condense the steam and thereby heat-up the water, but it will also deposit any impurities that may be in the steam into the dye bath. The steam coil fitted inside the dye vessel can easily be made and fitted to the kier, but has certain disadvantages. For instance, when the heating coils are placed inside the dye vessel the vessel requires to be larger, which results in an uneconomic liquor ratio, whereas the heat exchangers which consist of pipe bundles in a pipe casing, are placed outside the dye vessel and do not effect the liquor ratio unfavourably.

In placing heating coils inside the dye vessel it is sometimes difficult to get the whole of the coil surface exposed to liquor and, of course, some means of circulating the liquor has to be taken into account to speed up the heating, whereas in a heat exchanger a turbulent current inside the circulation pipes ensures quick transfer of heat. It will be readily seen that if quick heating-up is to be employed then whilst a heat exchanger could be made as large as required the coils must be limited otherwise the size of a dye vessel becomes prohibitive.

Another disadvantage of direct steam coils in the vessel is that when using superheated steam or hot water the dye liquor which comes into direct contact with the heating coils could be heated up to 150°C. or more, whilst that part of the liquor not flowing along the coils is still cold and both parts will only mix very slowly. This over-heated liquor represents a danger when certain dyestuffs or chemicals are being used. The new Thies apparatus fitted with heat exchangers and the new turbo pump is undoubtedly a development of considerable technical importance in addition to other factors such as less space requirements and maintenance.



New Cloth Pressing Process

A NEW cloth-pressing process to replace practices which have remained substantially unchanged for more than 60 years, has been announced by Mr. D. Finlay Maxwell (managing director, John Gladstone and Co. Ltd., Galashiels). The mechanism consists of portable electronically-controlled units, with numerous heating elements led from control panels to the pressing sections. The elements, around each of which a length of cloth is folded, send heat through the cloth and impart a finish claimed to be superior to that obtained by the old method. Each piece, according to type, receives heat suited to its texture and for the correct length of time. It is also pointed out that whereas the old system generates dry heat and heats the cloth from the outside to the centre, the new method sends moist heat from the inside outwards thus ensuring, it is said, a more even finish. The elements each weigh only 10 lbs. compared with six hot-plates of over 60 lbs. each and the labour required is only half that needed for the old.

Mr. Maxwell, owner of the patent, says he has been experimenting with the new process more than three-and-a-half years and had only recently perfected it. The problem had been to give each length of cloth—as many as 20 pieces at a time, each of different textures—variable heat for unequal lengths of time. "The steam 'hot-plate' system was old-fashioned, heavy and monotonous work," he said. "Each piece of cloth needed six hot-plates, weighing from 60 lbs. to 80 lbs. each, and this meant that in one pressing section, 20 lengths of cloth required 120 hot-plates to do the job.

This old system was not only wasteful of skilled labour but the heat given to the different types of fabric was not always suited to bring out the best in each cloth."

The apparatus is a step towards automation in pressing procedure. Design work is now complete for equipment which will interpret the manufacturers' and customers' requirements, the texture of the cloth, required temperatures, etc. transferring these to a punched card. Each piece with its coded instructions will automatically set up its own optimum conditions. This does not remove the traditional skill from the art of cloth-finishing, as skilled operatives must set up the cards. Once this has been done the instructions will be carried out automatically, and each operative will have a far wider range of finishes at his disposal. Mr. Maxwell said that so far as he knew, no similar advance has yet been devised in this country or abroad.

PRACTICAL AUTOMATION: METHODS FOR INCREASING PLANT PRODUCTIVITY. By L. R. Bittel, M. G. Melden and R. S. Rice. McGran-Hill Publishing Co., Ltd., 95 Farringdon Street, London, E.C.4 (Price 56s. 6d.).

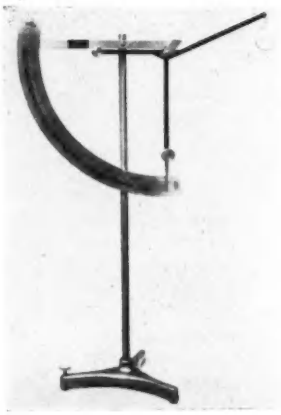
The authors of this volume are associate editors of the American periodical, "Factory Management and Maintenance," and therefore are favourably placed for choice of material. They have been at pains to make the book live up to its title and have limited themselves to the briefest discussion of the scope, characteristics and functions of automation, so that practically the whole of the text consists of a collection of short, illustrated articles of practical interest to management and technical personnel. These articles cover all four main categories of automation—transfer engineering, mechanised assembly, control engineering and information processing, and that the authors have cast their net wide is shown by the inclusion of two examples of successful automation operated by British firms. A particularly helpful and timely feature is a discussion of the ways in which partial automation can be applied with benefit to the smaller plant. Much of the text is written in a racy "journalese," which, rather than detracting from its effectiveness, impresses facts and principles more deeply on the reader's mind. Well chosen bibliographical reference draw attention to material for further study. C.L.W.

The New Tex Balance

THE new Tex-system recommended by the technical committee ISO TC 38 of the International Organisation for Standardization of textiles (ISO) is a direct weight numbering system based on the metric units g and m. The Tex count = 1 Tex = $\frac{1\ g}{1000\ m}$ i.e. the weight in g of given yarn length. Besides the normal Tex count, it is recommended to use millitex and kilotex.

On converting the usual yarn counts into Tex counts, decimal values are obtained which must be rounded-off. To insure a uniform conversion the committee has suggested a great number of rounded-off counts to be used for the Tex system only. Each rounded-off number applies to a given range. After conversion of the usual yarn count, the Tex value shall be replaced by the rounded-off Tex count applicable for the range in which the Tex value obtained by calculation is situated. The rounded-off Tex count represents the value nearest to the actual Tex count.

The principal features of the yarn numbering balance manufactured by Karl Frank GmbH., Weinheim-Birkenau and shown herewith are similar to those of the usual yarn numbering balance. The indicating hand is mounted in high precision ball bearings made in Switzerland so that accurate values are indicated. The scale is fitted with two measuring ranges. The first one for metric counts and the second range for Tex counts. The Tex scale is divided into black and white fields corresponding to the application range of the rounded-off Tex counts. The balance meets, it is stated, the specifications laid down in DIN 60905.



The new Tex-balance

Quality Water on Tap

DEVELOPED in association with British Filters Ltd., the water-de-ioniser marketed by Loughborough Glass Co. Ltd., Loughborough, is simple and compact, easy to install, and is designed to give water of first-class quality on tap. It consists of a plastic-coated metal cartridge A fitted with a threaded water-inlet at F. The cartridge contains ion-exchange resins mixed in the correct proportions to ensure both full utilisation of the resins and completion of the ion-exchange resins. To avoid any tendency for the resins to separate by flotation, the unit is designed for downward flow. Compressed foamed plastic pads S are fitted at intervals and, preventing channelling of the water through the resin bed, eliminate air pockets and take up any shrinkage in the resin, so keeping the bed compact. The cartridge screws on to the polythene base B at C and the de-ionised water flows into the base at C through a conductivity cell to monitor its quality and out through the control valve E. A warning light D stays on while the water is of satisfactory quality. The apparatus has been designed for a maximum flow-rate of 8 galls./hr., and, in areas where the water is soft, the makers say that outputs of 500 galls. or more can be obtained from a single cartridge before regeneration is necessary.

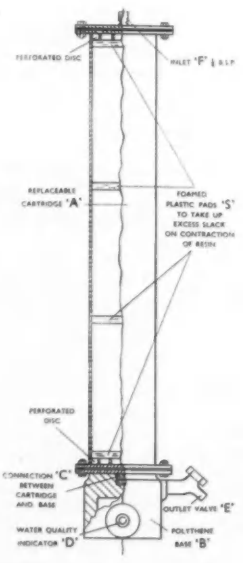
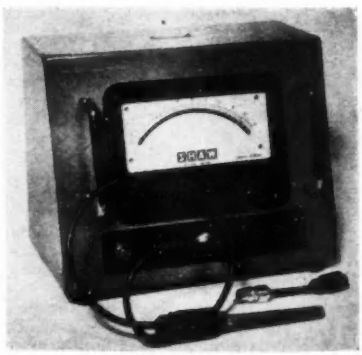

PERFORATED DISC
INLET 'F'
REPLACEABLE CARTRIDGE 'A'
FOAMED PLASTIC PADS 'S' TO TAKE UP EXCESS SLACK ON CONTRACTION OF RESIN
PERFORATED DISC
CONNECTION 'C' BETWEEN CARTRIDGE AND BASE
OUTLET VALVE 'E'
WATER QUALITY INDICATOR 'D'
POLYTHENE BASE 'B'

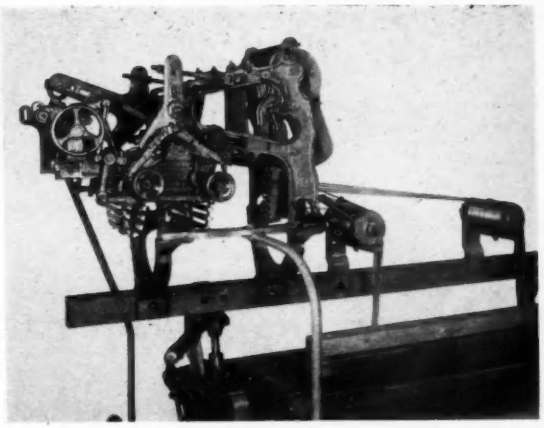
Diagram showing details of the water de-ioniser

Electronic Hygrometer

IN a new hygrometer announced by Shaw Moisture Meters, 31 Market Street, Bradford, the small detecting element consists of a capacitor with a hygroscopic dielectric, only a few microns thick, with a gold electrode. The detector is contained in a small, strong, fine wire gauze protector, which plugs into a coaxial cable connecting it to the recorder. The detecting element, 1 cm. dia. and 6 cms. long, can be used with any length of cable. It is stated that these hygrometers have already been successfully used as standard instruments by which checks are easily made on industrial relative humidity controllers, such as fitted in many factories, also for quick estimation of moisture in hygroscopic materials. The detector is placed in the material to be tested, and after a few seconds, when the pointer is steady, the moving coil meter indicates the moisture of the material on the easily read scale. Advantages claimed for the instrument include (*a*) a response time of a few seconds; (*b*) good long term stability; (*c*) negligible temperature errors and hysteresis; (*d*) can be checked and reset in a few seconds.



New Double Cylinder Negative Dobby



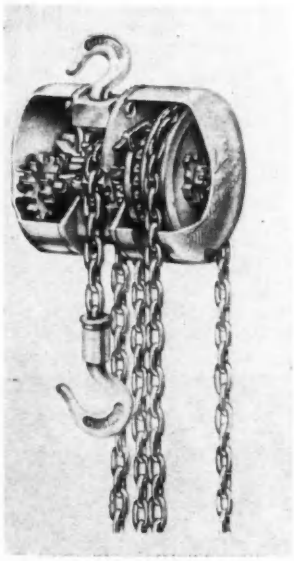
A NEW double cylinder version of the company's No. 254 model dobby which, in its single cylinder form, has achieved wide popularity for simplicity, reliability and ease of mounting, is announced by George Hattersley and Sons Ltd., Keighley. Strong and robust in construction, the dobby follows the traditional Keighley V-design—which originated at their works—and the heald levers may be either upright or hang down as shown in the illustration. Accurately ground to pitch, the strong interchangeable levers and baulks, are replaceable without disturbing other parts.

This dobby is suitable for any width of loom from 36 ins. reedspace upwards and the maximum shed available is 6¼ ins. A small cylinder at the front, with link chain and bowls controls—through a very simple linkage—which of the lag cylinders is to be swung into contact with the feelers, and at the same time disengages the alternative pushing catches.

The dobby is available with any number of shafts from 12 to 25, and should be particularly useful in the handkerchief, headsquare, scarf and similar trades where the number of lags is required to be kept to a minimum. The low and accessible mounting of the dobby does not obstruct the light and its position ensures that any dirt or oil falls clear of the warp. Where required, a dobby can be very quickly removed from one loom to another even when the reedspaces are different.

Lightweight Safety Hoist

A NEW lightweight hoist (33 lbs.), having a capacity of half a ton, is announced by Yale and Towne Manufacturing Co., Wednesfield, Wolverhampton. Extensive use is made of alloy materials, Grade 8a load chain, and it is fitted with easily detachable aluminium covers. For safety, the hoist has drop-forged steel hooks designed to open slowly, without breaking, in the event of severe overloading. This provides warning for the operator before any other part of the hoist is damaged. The load sheave, an aluminium bronze casting with five accurately-machined chain pockets, is supported both sides by a single-row ball-bearing of the double-shielded type.



The brake is of the Weston screw and disc self-actuating type. Pressure increases in proportion to the load which is held firmly by a ratchet and pawl in any desired position. A downward pull on the hand-chain smoothly releases the brake and allows the load to be lowered. Gears and pinions are machined from alloy steel, heat-treated to provide ample strength and wear resistance. They are arranged in balanced gear construction to ensure even loading. All gears are splined to their spindles. Minimum distance between the hooks is 11½ ins. and with the standard length of load chain, maximum distance between hooks is 10 ft. Use of ball bearings makes operation easy. With full load, a pull of 70 lbs. is required, and a lifting speed of 4½ ft./min. is easily achieved. The lifting speed at quarter load increases to 11 ft./min.

Noise

A conference on this subject, dealing particularly with noise in industry, has been organised by the British Occupational Hygiene Society. It will be held in London April 1, 1958. The conference is open to non-members of the society on payment of a registration fee of one guinea. Further details can be obtained from the Hon. Scientific Secretary, Dr. D. Turner, Associated Ethyl Co. Ltd., Ellesmere Port, Cheshire.

Zagreb Fair—Textile Section

In this year's Zagreb Fair, April 11 to 20, there will be an international textile and fashion section and Auger and Turner Group Ltd., 40 Gerrard St., London, W.1, are organising a special British stand in this section. Among the British exhibitors who have already booked space are manufacturers of swimwear and woollen and worsted piece goods. Auger and Turner group are staffing this British stand so that individual firms taking part do not need to maintain personnel on the spot. All inquiries and orders will be dealt with by competent staff. Regular fashion parades will be held in the section throughout the duration of the fair, and British exhibitors will have the opportunity of showing garments in these parades.

Canadian Textile Conference

Mr. S. J. Hungerford (president, Textile Technical Federation of Canada) is chairman of the programme committee of the Canadian Textile Conference to be held at Queen Elizabeth Hotel, Montreal, May 6, 7 and 8, 1958. Mr. Hungerford is market analyst in the Textile Fibres Division of du Pont Co. of Canada.

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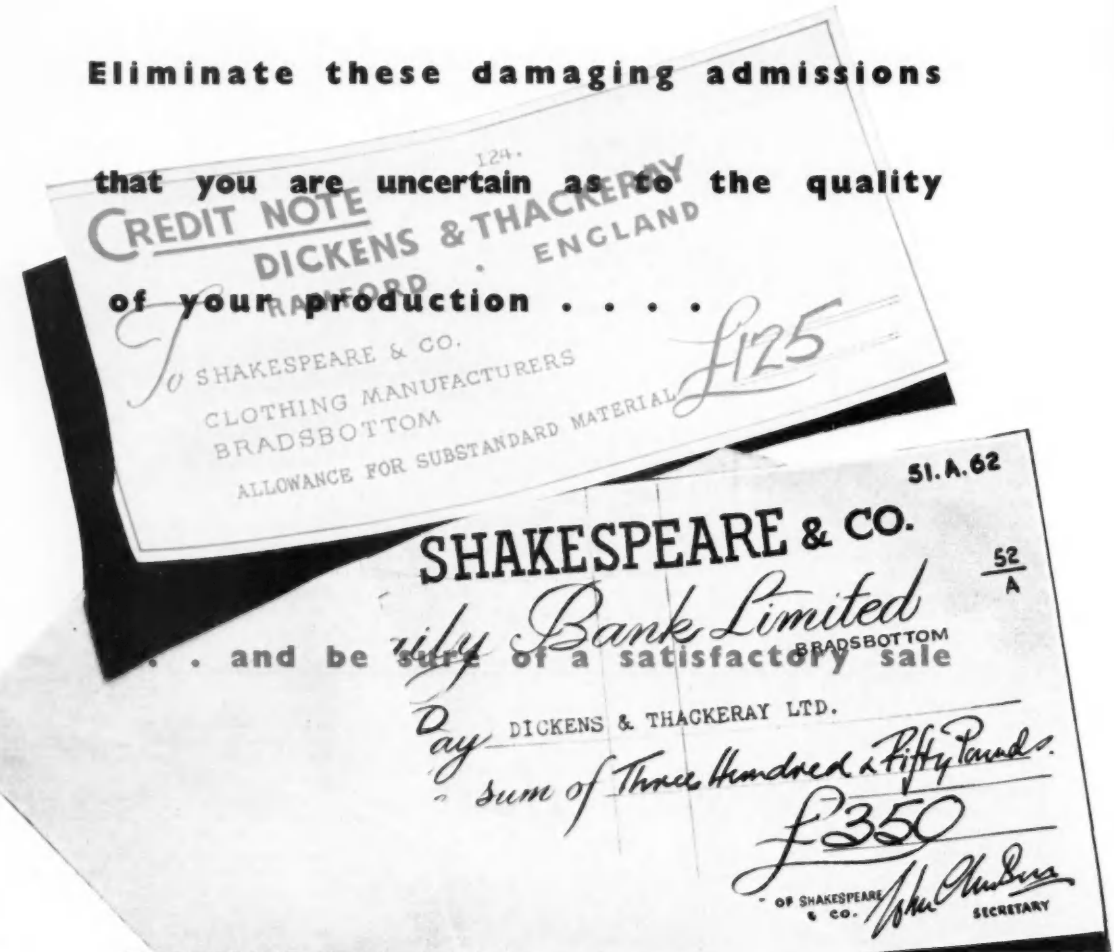

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Recent Developments in Textile Finishing

New developments include a novel treatment designed to largely eliminate "pilling" on synthetic fibre fabrics, also new water-proofing compositions for cotton and other fabrics, and anti-static agents for synthetic fibres, etc.

By B. C. M. DORSET

ONE of the most interesting from the scientific viewpoint but difficult from the practical aspect of textile finishing problems during recent years has been associated with that curious phenomenon known as "pilling". It is true, of course, that "pilling" occurs in some kinds of wool knitwear but not to so great a degree as is sometimes experienced with garments made with the newer synthetic fibres. "Pilling" is the formation, as a result of wear and washing, of small, fuzzy balls of fibre which cling very tenaciously to the surface of a fabric. It is generally more evident in a fabric of loose or open texture and especially if it is made from soft spun yarns. For the formation of pills, fibres have to work their way at least partially out of the fabric surface and this is obviously more difficult when the fibres are closely bound to each other in the yarn by hard twisting. Various expedients have been adopted to overcome this defect and B.P. 786,868 not only describes a new form of preventive treatment but also discusses several interesting details as to why "pilling" occurs with synthetic fibres but much less so with fabrics made of the older fibres.

The essential feature of a synthetic fibre which makes it susceptible to "pilling" is that it is usually very smooth—its movement relative to other fibres in the threads of the fabric is thus comparatively easy. Thus during wear or other treatment in which abrasion of the fabric surface takes place these smooth fibres can be rubbed outwards so that their ends protrude more and more. There comes a stage in this working-out of the fibres where the protruding ends of a number of fibres near together become entangled so as to form fuzzy balls or pills anchored in the fabric surface by at least a few of the fibres. It is at this stage that a special feature of fabrics made with synthetic fibres is revealed. In the case of wool fabrics this same working-out of fibres can occur but owing to a lower fibre strength the pills soon become rubbed off the fabric surface during ordinary wear so that the "pilling" does not accumulate to a point at which it spoils the appearance of the fabric by becoming noticeable. On the other hand, synthetic fibres are usually much stronger so that the pills remain tenaciously bound to the fabric surface and steadily accumulate to a noticeable degree. It is believed that if the synthetic fibres were as weak as wool or some other fibres then the "pilling" on fabrics would not occur or at least would not present the difficult problem that it has.

With the above facts in mind chemists of the du Pont company in America have sought some type of finishing process by which the working out of the fibres essential to "pilling" can be prevented. They have not sought to use a method based on a weakening of the fibres for obvious reasons, and this research has led to a very novel treatment which is claimed to largely eliminate "pilling" in synthetic fibre goods. It involves two stages, i.e., brushing and shrinkage. The brushing is not employed, as might be expected, to raise a pile surface but rather to produce local flattening and distortion of shape of the fibres along their length as shown in Fig. 1. To achieve this it appears most satisfactory to run the fabric over two suitably spaced guiding rollers as shown in Fig. 2 so as to press against a rotating brush under specially arranged conditions. The brushing must be such that each bristle contacts the fabric surface to effect a so-called heel-to-toe brushing which smoothes or polishes but does not pluck the exposed crowns of the threads in the fabric surface. A suitable brushing of this kind can be produced by wrapping a cylinder with a type of wire card clothing similar to that used on a "fancy" in a roller and clearer card. It is necessary to arrange the conditions of rate of rotation of the brush and the speed of travel of the fabric against it under an

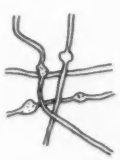


Fig. 1. Showing disfigured fibres as produced by the special brushing treatment

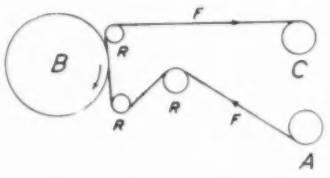


Fig. 2. Showing fabric F leaving batch roll A to pass around guiding rollers R and be brushed by brush B and finally be wound on batch roll C

adjusted pressure so that a certain amount of frictional heat is developed. This heat softens the thermo-plastic synthetic fibres sufficiently to enable the brush points to produce the spaced flattening shown in Fig. 1.

The nature of heel-to-toe brushing can be understood by reference to Fig. 3 in which is shown a horizontal brush bristle A moving downwards and about to contact fabric F moving upwards. The end of the bristle near to the fabric is said to have toe T, foot P, and heel H. The movement of this bristle across the surface of the fabric ensures that the toe enters it preceded by the heel and foot, i.e., a stroking or brushing action. After the surface fibre disfiguration is obtained it is necessary that the points at which the fibres have been disfigured be locked within the fabric structure and this can readily be achieved by a shrinking process.

All synthetic fibres tend to shrink when brought under conditions which allow release of the latent strains within them produced during the high stretching to which they are normally subjected during the course of their manufacture. Thus simple boiling of a synthetic fibre fabric in water rapidly produces a shrinkage of at least 2% and it can be sufficient to lock the disfigured fibres, but it is possible to induce greater shrinkage when desired by the simple expedient of applying a fibre-swelling agent which loosens the internal structure of each fibre. A simple dry high temperature treatment also produces a shrinkage which is sufficient for this special purpose.

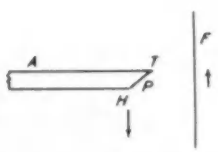


Fig. 3. Showing the toe T, heel H and feet P of the brush bristle A about to engage by heel-to-toe movement in the surface of moving fabric F. The brush bristle A is moving in the opposite direction to that of the fabric

Thus the new treatment of synthetic fibre materials so that they be resistant to "pilling' during normal wear consists of brushing the surface followed by shrinking their surface area. Locking of the disfigured fibres within the fabric surface as produced by shrinkage results from a closing-up of the threads and also from an increase of yarn twist.

In thus processing a 2×2 twill fabric of Dacron (polyester fibre) it can be given a light smoothing nip by a wire brush of 15 ins. dia., running at 750 r.p.m. The bristles of the brush should be 36 gauge wire, 0·75 ins. long, of round cross section, and ground to provide a heel-to-toe bite. The fabric is moved at the rate of 2 yds./min. in a direction opposite to that of the brush. Thereafter the fabric is led over a pin stenter and subjected to a temperature of 360°F. for about 45 secs. and thus be induced to shrink 4% in both warp and weft. When such fabric is tested in comparison with other fabrics it shows marked superiority to "pilling" as the following results show:

Fabric	No. of pills formed per sq. in. in "pilling" test
Untreated fabric ..	8
After brushing and shrinkage	2
After brushing only ..	10
After shrinkage only ..	6

The treatment is equally effective with fabrics made from yarns consisting of a 55/45 mixture of Dacron and wool, or a 75/25 mixture of Dacron and viscose rayon staple fibre, or a 65/35 mixture of Dacron and cotton. It is not essential that the brushing and shrinking treatments should follow each other immediately; it is possible to carry out other treatments between but the shrinkage should be effected always *after* the brushing.

New Waterproofing Compositions

In recent years organic compounds of several polyvalent metals such as tin, zirconium, lead, aluminium, etc., have found increasing use in connection with polymers either to impart increased stability to heat and light or modify their properties in some other special direction. Aluminium compounds have long been used in waterproofing cotton and other fabrics and in recent years similar use has increasingly been made of zirconium compounds. It is an important fact that the deposition of a mixture of zirconium oxides and hydroxides within fabric can render it highly water-repellent and it is possible to improve this effect by having present at the same time a fair proportion of a wax which is both a softener and also a water-repellent. Titanium oxides and hydroxides have similar properties to those of zirconium.

The main problem in making use of these facts lies in discovering the most satisfactory method for achieving this deposition of the oxides and hydroxides. One method investigated is that of applying to the textile material a metal ester such as butyl titanate under anhydrous conditions and then hydrolysing this ester to leave the titan oxides and hydroxides in the fabric. Only partial success has thus been obtained, either because the metal esters were too unstable so as to break down in the treating liquor or because the deposited hydrated oxides (the mixture of oxides and hydroxides) were contaminated

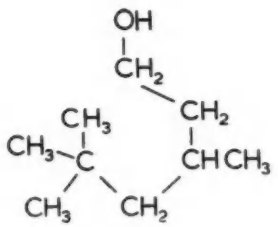
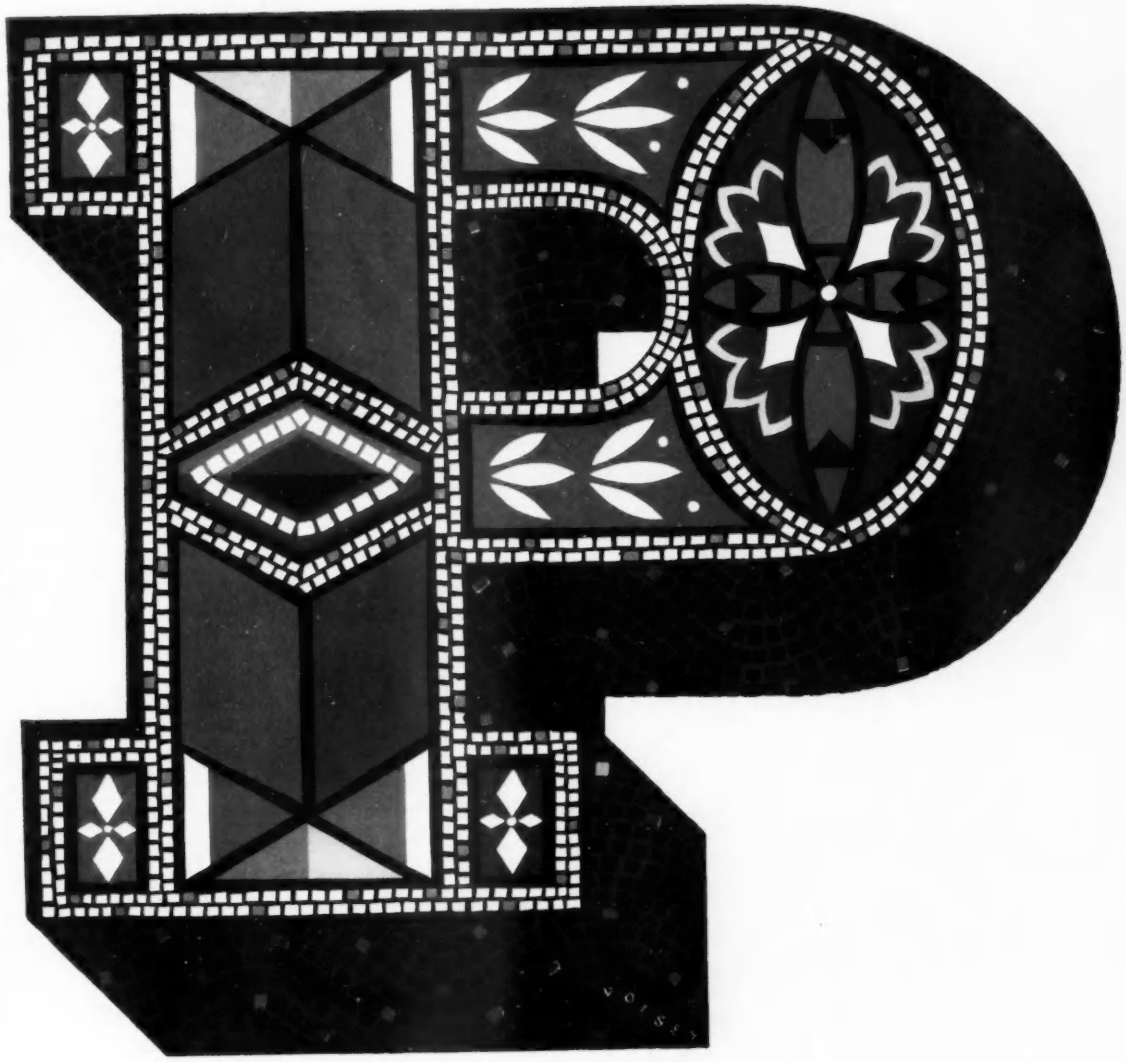


Fig. 4

with a hydrophilic residue used in the treating liquor to aid its application. Now according to B.P. 786,444 an improved method has been devised which allows very satisfactory waterproofing and which, if desired, can be adapted to be very easily applied at or about the time of dry cleaning textile materials.

The new method is based on the use of entirely new esters of titanic and zirconic acid—they are those made from 3 : 5 : 5-trimethyl-hexanol-1 (otherwise known as nonyl alcohol or under the trade name of Nonanol for a 90% pure product) which has the formula given in Fig. 4. The new esters are thus tetra-nonyl titanate and tetra-nonyl zirconate. They can be readily hydrolysed by the action of water or steam to yield the corresponding hydrated oxides but they have sufficient stability (as distinct from other titanium and zirconium esters which have hitherto been employed) to allow their satisfactory application to textile materials without premature hydrolysis. The



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Wood engraving by John Farleigh

The man with fire in his hair

ABOUT THE BEGINNING of the 18th century many sailors along the Spanish Main had an awesome experience. On dark nights their ships were boarded by pirates led by a man who had fusematches fizzing and burning in his ears and hair. His name was Captain Teach—alias Blackbeard—the most prosperous pirate of his time. Nervous sailors seeing him afire jumped overboard shouting that they were fighting the devil. Blackbeard's career ended in 1718 when a Lieutenant Maynard, from the Royal Navy, boarded his ship and shot him dead.

Now pirates are as out of date as the galleons they once manned. People safely sail the seven seas but goods are still often manhandled on their voyages across the world. Nevertheless they travel comfortably and arrive safely in cartons made from 'Thames Board' and in 'Fiberite' cases made from solid or corrugated fibreboard.

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following are three typical compositions which may be used for waterproofing:

(1) 70 lbs. of paraffin wax or a micro-crystalline wax
40 lbs. of tetra-nonyl titanate
15 lbs. of tetrachlorethylene

(2) 100 lbs. of paraffin wax
25 lbs. of refined petroleum jelly
15 lbs. of butyl acetyl riconoleate
80 lbs. of tetra-nonyl titanate
30 lbs. of tetra-chlorethylane

(3) 70 lbs. of a micro-crystalline wax
20 lbs. of tetra-nonyl titanate
20 lbs. of tetra-nonyl zirconate
15 lbs. of tri-chlorethylene

A general procedure consists of using one or other of the above compositions, after suitable dilution with a dry cleaning solvent such as white spirit, for the impregnation of wool, cotton, viscose rayon, nylon, silk, etc. fabrics, then removing excess of the liquor, drying, and steam-pressing to bring about the hydrolysis of the metal ester. No further processing is necessary.

The No. 2 composition is probably about the best for general use and also for introduction as a stage in the dry cleaning of various types of textile materials such as raincoats, dress fabrics, gabardine suitings, etc. For such use it should preferably be diluted with about five times its own weight of white spirit.

The new titanic and zirconic acid esters of nonyl alcohol are very conveniently made from the corresponding butyl esters (readily available) by a process of alcoholysis in which say butyl titanate is mixed with nonyl alcohol (Nonanol or 3 : 5 : 5-trimethyl-hexanol-1) and the mixture then distilled under reduced pressure when the distillate consists mainly of n-butyl alcohol while the residue consists of the desired titaneium nonyl ester substantially in a pure form.

It is claimed as a useful advantage of this new method for waterproofing textile materials that these are less liable to "sweal" and "ride". The term "sweal" covers the greasy bands or patches which may be formed on fabric waterproofed by other methods and arise as a result of too heavy a local deposit of the waterproofing agent arising from irregularity in processing as for example uneven hydroextraction. The term "ride" covers a purely surface deposition of the waterproofing agent in such a manner that when the fabric is scratched with the fingernail a permanent mark is formed.

Finishing Synthetic Fibre Fabrics With Resins

The finishing of nylon, "Perlon," "Orlon," "Terylene," and similar fabrics made from thermoplastic fibres is in certain cases attended by difficulties which in some instances have not been easily overcome. Such difficulties are especially encountered when applying to the fabric stiffening treatments based on the use of thermosetting and thermoplastic synthetic resinous bodies. For example, in applying a thermoplastic resin (usually in the form of an aqueous dispersion of the fully formed resin) the stiffened finish will be fast to water but often not to dry cleaning solvents. Moreover, the surface of the finished fabric may easily show a permanent mark after being scratched with the fingernail or after folding or after being rubbed on a rough surface; such marking is usually termed "chalking". In the case of thermosetting resins such as those derived from urea- and melamine-formaldehyde and which are usually applied in their precondensate forms followed by a high temperature cure it is found that the stiff finish may be fast to washing and dry cleaning and resistant to "chalking" but that fabric yellowing results from the curing stage (this yellowing is less likely to be incurred if advantage is taken of the fact that melamine-formaldehyde resins can be satisfactorily cured at a relatively low temperature). However, it has been observed that a melamine-formaldehyde resin has so high a decomposition temperature that the resin prevents the fibres from melting on ignition and thus enables the finished fabric to propagate a flame whereas the unfinished fabric would not do so. It can thus be expected that improved stiffening agents for such synthetic fibre materials are required. This demand can be satisfied by the special lower alkyl ethers of methylol ureas as described in B.P. 787,674.

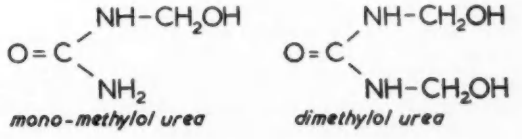
The methylol ureas which have proved most satisfactory are dimethylol urea and mixtures of mono- and dimethylol ureas having the formulae given in Fig. 5 and in which the molecular ratio of urea/formaldehyde lies between 1/1·5 and 1/2. It is further required that at least 75% of all the methylol groups be etherified and this may be effected with such lower alcohols as methyl, ethyl, propyl, and iso-propyl alcohols. These particular ethyrified methylol ureas are substantially monomeric and crystalline and give aqueous solutions of relative low viscosity. Blouse fabrics can be given a firm finish by application of a 5% solution of one or other of these etherified methylol ureas while it requires treatment with a 40% solution to give the stiffening required in a heavy nylon shoe mesh fabric. The point about the low relative viscosity of the solutions is that if a net material is being finished there is less risk of filling the meshes ("windowing") than when a viscous solution is used. Use of these special products enables the various difficulties and defects mentioned above to be overcome.

In a typical example of this new processing a 30 den. nylon dress fabric was padded through a solution containing 30% of the methyl ether of a mixture of methylol ureas having a urea-formaldehyde ratio of 1/1·9 and a degree of methylation of 85% and also containing 1·5% of a catalyst such as ammonium thiocyanate. The fabric was then dried and cured for 2 mins. at 140°C. when a stiffened finish free from chalking and of satisfactory resistance to washing and dry cleaning was obtained. The inflammability of the fabric was unaffected since when ignited and held horizontally it would not propagate a flame. It may be noted for comparison that when similar fabric was stiffened with a 30% solution of a commercial methyl ether of trimethylol melamine and the same catalyst this solution was sufficiently viscous to effect windowing while the stiffened fabric completely burnt out on ignition.

Increasing the Water-Absorption of Nylon

Synthetic fibres differ essentially from natural fibres in being hydrophobic so that they only reluctantly absorb water from humid air or when wetted. Whereas the natural moisture regain of cotton is about 6% and viscose rayon about 12%, that of nylon is around 4% and of such fibres as "Terylene" and "Orlon" almost nil.

Fig. 5.



For this reason synthetic fibre underwear garments can feel cold under conditions of free perspiration although to some extent this defect can be mitigated by suitably adjusting the texture of the fabric and by using staple fibre instead of continuous filament threads. However, it would seem that alternative methods for making such materials more moisture absorptive could be based on either modifying the surface of the fibres or by coating such fibres with a substance having hydrophile properties yet capable of tenaciously adhering to the fibres. Progress in the latter direction has recently been made with nylon and the methods adopted are described in B.P. 757,274 and 788,688.

For some time it has been known that nylon can be given a considerably increased water-absorption capacity by treating the fibres with emulsions in weakly acid aqueous alcohol of polymethyl-methylol hexamethylene adipates (these latter are made from ordinary nylon by treatment with formaldehyde to give the methylol derivative and with then methyl alcohol to effect the required degree of methylation). Then followed the discovery (B.P. 757,274) that the change could be more conveniently effected by using instead alcohol-soluble mixed polyamides which can be made in a relatively simple manner from caprolactam and hexamethylene diamine and adipic acid, and also that most satisfactory is a treatment in which the nylon fibres are treated with an aqeuous alcohol emulsion of an alcohol-soluble mixed polyamide in the presence of one or more linear polyesters produced from dihydric alcohols and dibasic acids. This latter treatment is especially effective when applied to "Perlon" and polyamide fibres of this type made from self-polymerised caprolactam (aminocaproic acid). To illustrate this treatment the following example is given:

Four parts of a mixed polyamide prepared from equal parts of caprolactam and hexamethylene-diamine adipate polyamides, 10 parts of glycol, 180 parts of methyl alcohol, 25 parts of water, and 10 parts of polysuccinic acid glycol ester are slightly warmed until a clear solution is obtained when this is poured into 1,500 to 4,500 parts of water which is preferably free from hardness. The mixture is heated to 30°C. and rendered slightly acid by adding three to four parts of acetic or citric acid.

In the treatment, 750 parts of say a nylon knitted material are then slowly heated in this liquor for about 20 mins. at 45 to 50°C. and then hydro-extracted and dried at about 100°C. The fabric thus gains much in water absorptive capacity and this is actually improved yet further by a washing in soap liquor. As showing how much the nylon knitted fabric is changed it may be noted that if a drop of water is placed on the fabric it will be absorbed within one-half second and show a moist area of 23 mm. dia. whereas under the same conditions using untreated fabric the drop will require 65 secs. to become absorbed and then yield a moist area of only 5 mm. dia.

The further progress towards making polyamide fibres more moisture receptive as disclosed in B.P. 788,688 is based on the discovery that N-methoxy methyl polyamides can be readily brought into stable colloidal solutions or emulsions and that when a polyamide fibre material is dipped into such a solution with a suitable linear polyester also present the N-methoxy methyl polyamide particles are attracted to the fibres so that on drying at about 100°C. these particles become permanently fixed and give the fibres the desired increased affinity for water. The essential practical details for carrying out this treatment are indicated below.

Since the water-soluble polyester derived from succinic acid and glycol is very suitable for use this is first made by heating together four moles of glycol and one mole of succinic acid for 16 hours to 150°C. in the presence of a catalyst. The treating liquor is then prepared by adding 120 grams of the polyester product obtained as described above to 60 grams of an N-methoxy methyl polyamide made a 10% introduction of methoxy methyl groups into caprolactam, then adding 45 grams of water and 1,200 c.c. of methyl alcohol. After standing for 14 days the clear supernatant solution is poured off with filtration. For every 50 parts of decanted solution there is added 38 parts of water whereby any impurities precipitated can be filtered off. The filtrate is then poured into 10 to 20 times its volume of hard water to give a milky emulsion which is finally filtered through a cloth. Thus is obtained the treating liquor containing a linear polyester and an N-methoxy-methyl substituted polyamide which is unaffected by hard water and which is at once suitable for treating polyamide fibre fabric; after the treatment the material is hydroextracted and dried at 100 to 105°C. for one hour. The N-methoxy methyl substituted polyamides mentioned are characterised in having a proportion (say 10%) of their amide groups changed in the manner shown in Fig. 6 as a result of treatment with formaldehyde and methyl alcohol in the presence of an acid.

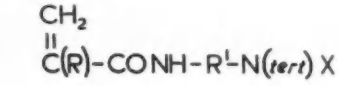


Fig. 7.

Anti-Static Agents for Synthetic Fibres

B.P. 788,079 discloses the usefulness of certain polymeric quaternary ammonium compounds made from monomers conforming to the general formula appearing in Fig. 7, in which *R* stands for hydrogen or -CH_3, R^1 for an alkylene radical in which the carbon chain may be interrupted by heteroatoms (e.g., oxygen), N(tert) stands for the group of atoms forming an aliphatic or heterocyclic tertiary amine, and *X* stands for the mono-valent anion of a salt-forming acid. Such compounds applied to synthetic fibres have the power to reduce their tendency to accumulate static electricity during manipulation and in which they are likely to be subject to friction. The treatment involved consists of simply immersing the synthetic fibre material in a liquor containing these special compounds, then hydroextracting or mangling, and drying. An improved effect may sometimes be obtained by further heating the treated material up to 150°C.

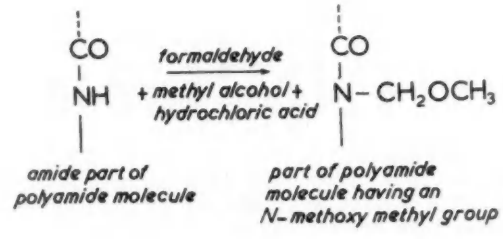


Fig. 6.

The particular polymeric quaternary ammonium compounds used for these anti-static compounds and in which the group N (tert) contains at least one alkyl or aralkyl group are prepared from an N-(tertiary amino-substituted alkyl) acrylamide or methacrylamide preferably of the formula shown in Fig. 8 in which $-N = R^1R^2$ is a dialkylamino group or a heterocyclic ring, and R and R^1 have the same significance as stated above. It has been found that it is the polymeric quaternary ammonium salts derived from such amides as are most valuable

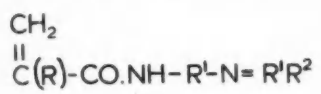


Fig. 8

for reducing the tendency of the fibre to accumulate a charge of static electricity. Examples of suitable N-(tertiary amino-substituted alkyl) amides areN-(beta-diethylaminoethyl)-methacrylamide, N-(gamma-dimethylaminopropyl)-methacrylamide, N-(beta-piperidinoethyl)-methacrylamide, N-(gamma-dibutylaminopropyl)-acrylamide, and N-(gamma-dibutylaminopropyl)-methacrylamide.

In a recommended method for preparing such an anti-static agent the preparation involves reacting methacrylyl chloride with N : N-diethylethylenediamine to give N-(beta-diethylaminoethyl)-methacrylamide and then quaternising this with dimethyl sulphate in the manner shown in Fig. 9. Then follows

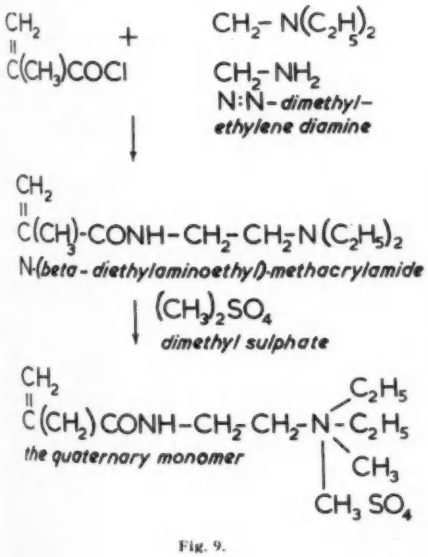


Fig. 9.

Fabric under test	As treated with the anti-static agent		Treated and washed once		Treated and washed five times	
	Charge developed	Time for charge to fall to half value in seconds	Charge developed	Time for charge to fall to half value in seconds	Charge developed	Time for charge to fall to half value in seconds
"Terylene" mock leno fabric (treated) ..	1440	108	128	1	136	1
"Terylene" mock leno fabric (untreated) ..	2080	123	1980	51	2320	180

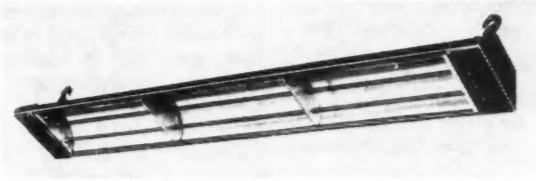
polymerisation of the quaternary ammonium monomer in aqueous solution at 100°C. using ammonium persulphate as a catalyst. This anti-static agent is applied in the form of a 1% aqueous solution to say "Terylene" fabric with a 33% liquor pick-up and the fabric is then dried at room temperature and further baked for 10 mins. at 150°C.

Some idea of the efficacy of such an anti-static agent can be inferred from the data provided in Table I which were obtained using a standard form of test (Amer. Dyestuff Rep., 1951, *40*, 164) in which the electrostatic charge resulted from rubbing the treated textile material against a botany wool serge fabric.

The above results show that while the "Terylene" fabric is less subject to accumulate electrostatic charge immediately after the treatment with the anti-static agent a simple soap wash is sufficient to greatly increase this resistance. Such soaping also greatly assists the rapid dissipation of any charge which may have accumulated—there is no parallel to this effect with the "Terylene" fabric not treated with the anti-static agent. Much the same results are obtained with nylon fabric instead of "Terylene."

Industrial Electric Heaters

TWO new industrial infra-red heaters of 2½ kw. and 4 kw. loadings have been introduced by Dimplex Ltd., Millbrook, Southampton, who point out that field experience has shown that in many industrial premises, the usual loading of 3 kw. is not quite sufficient to give downward punch in the heat drive and for this reason they have departed from the usual loading ratio with their 4 kw. model. Recommended mounting height of these heaters should be between 11 and 13 ft. to give a beam spread of between 20 and 28 ft.



Ruggedly constructed and attractively styled, these new models are suitable for single or 3-phase supply. They are made of pressed steel and incorporate three industrial Inconel elements which are stated to be anchored in such a way as to preclude even the possibility of element fatigue. Mounting is by conduit or chain suspension or by direct fixing to the wall with the use of appropriate conduit fittings. The IRI.25 model, loaded at 2½ kw., is 30 ins. long, it has a height of 2⅞ ins. high and 6½ ins. wide. Model IRI.40, loaded at 4 kw., is 48 ins. long, it has a height of 2⅞ ins. high and 6½ ins. wide. The heaters are in full production and full details are given in Publication No. D.301, available from the firm.

E.C.G.D. Staff Changes

The Export Credits Guarantee Department, 59-67 Gresham Street, London, E.C.2, announces the retirement of Mr. W. E. Knox, C.M.G., director of its administration division. He will be succeeded by Mr. F. H. Whitaker, O.B.E., formerly in the industries and manufactures department of B.o.T. The administration division is responsible for all matters involving claims made on the department under its guarantees and for finance and general administration.

Finishing "Orlon" Fabric Constructions†

"Orlon" can be treated by various chemical and mechanical methods to alter its colour, enhance its hand or surface appearance and to modify its properties

MOST fabrics of "Orlon" acrylic fibre require scouring before dyeing to remove soil and sizes or other agents applied to fibre or fabric during processing. This ensures level, clear dyeings free from blotches and shaded areas. First, the "Orlon" should be rinsed in cold water to eliminate easily-removed materials before they have an opportunity to become set by heat. This bath is dropped and the goods scoured with 1·0% of a detergent such as "Duponol" RA surface active agent, at 140° to 180°F. for 20 mins. The addition of 1·0% tetrasodium pyrophosphate is helpful in removing difficult soil. At the end of the scour, a warm rinse followed by a cold rinse helps to remove all traces of detergent and soil. Whenever blends of "Orlon" are to be dyed with cationic dyes, scouring with a nonionic detergent such as "Alkanol" HCS helps to minimize staining of the other fibre by the dyes.

With some constructions of "Orlon" it may be advisable to stabilize the fabrics by an open width boil-off or crabbing before scouring. Persistent grease or oil stains have been best removed with naphtha-type solvent emulsions. These emulsions are padded on to the goods and allowed to stand for at least two hours before scouring.

Bleaching

Since "Orlon" staple was first introduced, its whiteness has been improved considerably. Now, for many end uses, bleaching is unnecessary, but if additional whiteness is desired, it can be readily obtained.

100% "Orlon."—Spun yarns and fabrics of 100% "Orlon" may be whitened by scouring in a bath containing formic acid, a detergent, a blue dye, and a fluorescent whitening agent.

Procedure

1. **Set the bath at a temperature of 100° to 120°F. with the following ingredients using a 30-40 : 1 bath to goods ratio:**
   - **2·0% "Duponol" RA surface agent**
   - **3·0% formic acid (90%)**
   - **0·002% "Latyl" Blue RL**
   - **0·5% "Tinopal" ANA* or "Uvitex" U****
   - **10·0% Glauber's salt (calcined).**
2. **Raise the bath temperature to the boil and hold for 1½ hours.**
3. **Cool the bath slowly and rinse clear.**
4. **Finish the material as desired.**

Goods that contain heavy soil or size should be pre-scoured or desized before bleaching. Most of the improvement in total whiteness is made by the scour with "Duponol" RA and formic acid. This part of the procedure can be used to whiten "Orlon" in blends with other fibres.

The small amounts of blue dye and white dye are used to improve the cast of the whitened fibre. "Latyl" Blue RL is used as the blue dye because of its good lightfastness and its limited affinity for "Orlon". Dyes that have a higher affinity are difficult to apply levelly at very low concentrations. The optimum amount of blue dye is from 0·0015 to 0·002%. "Tinopal" ANA and "Uvitex" U have been selected as the white dyes because they have good affinity for "Orlon" and comparatively good lightfastness on "Orlon". There may be other fluorescent white dyes that work equally as well. In the preceding formulation, concentrations varying from 0·10 to 0·50% give a desirable hue. Glauber's salt aids in levelling the white dye.

Sodium Chlorite Bleach

Treatment in the following bath for one hour at 190°F. effectively bleaches spun yarns or fabrics of 100% "Orlon":

1·5 gm./litre "Textone" (sodium chlorite).

0·5 gm./litre nitric acid (61%).

After bleaching, the material should be thoroughly rinsed and scoured to remove traces of residual chlorine.

Caution: "Textone" contains sodium chlorite, a vigorous oxidizing agent that can be hazardous to both personnel and equipment when improperly used. Therefore, all suggestions of the manufacturer (Olin Mathieson Chemical Co.) should be followed regarding its use. Good ventilation is important.

Because acid "Textone" is highly corrosive, the bleaching equipment should be stainless steel, preferably Type 316 or 304. Use of nitric acid with "Textone " retards the pitting of Types 316 and 304 stainless steel.

Blends with Cotton

It is usually necessary to bleach and remove motes from the cotton component of a blend of "Orlon" and cotton. This can be accomplished by treating the material for an hour at 180°F. in the following bath:

10·0 gm./litre "Albone" 35 hydrogen peroxide.

3·5 gm./litre sodium silicate* (to pH 9·0 - 9·5).

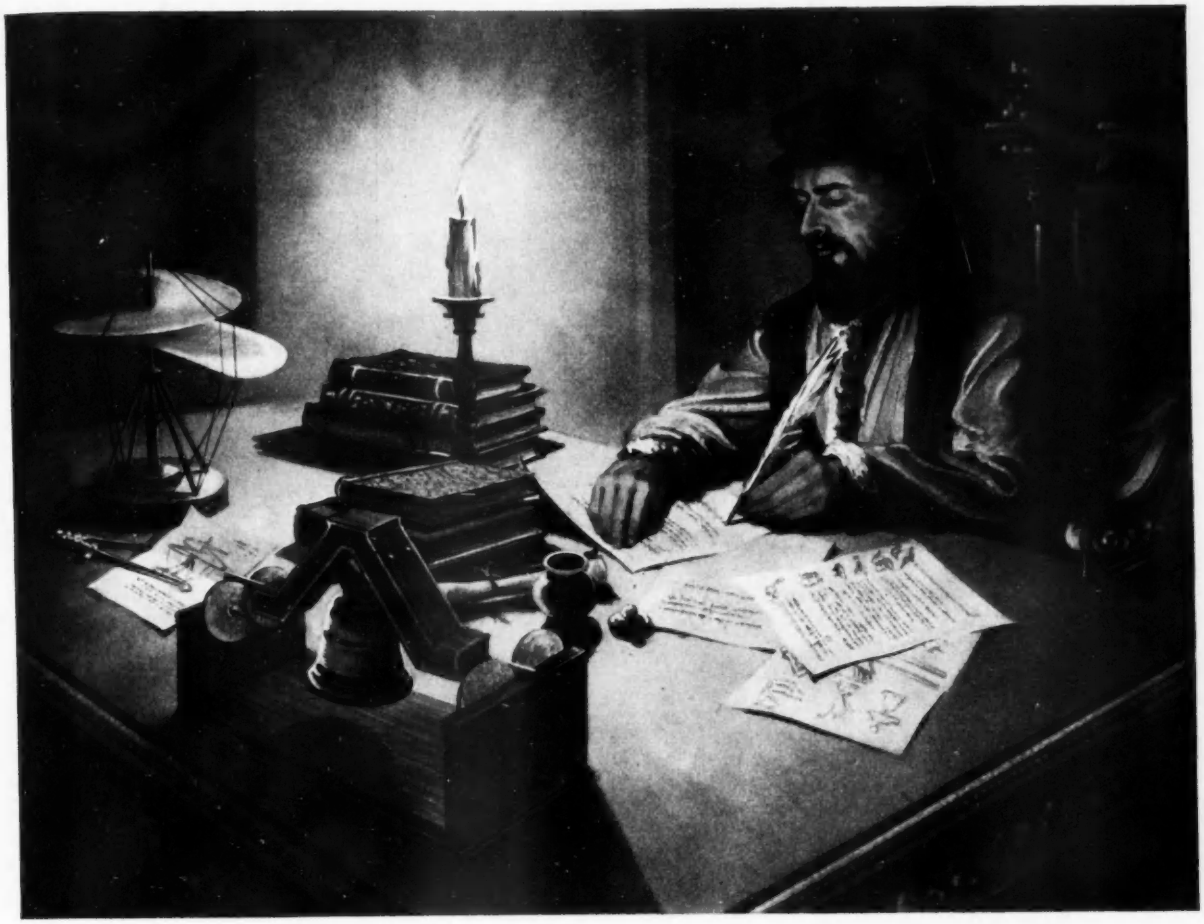
This treatment bleaches the cotton, removes motes and prepares the cotton for dyeing. Caustic treatments at elevated temperatures must be avoided, since such treatments degrade the "Orlon". Following the peroxide cotton bleach, the "Orlon" can be whitened by the formic acid-detergent scour previously described. A fluorescent white dye and a small amount of a blue dye can be applied to improve the cast of the "Orlon".

† *From a recent technical bulletin released by E. I. du Pont de Nemours and Co.*

* *Geigy Dyestuffs.*

** *Ciba Co., Inc.*

* *Grade 30 sodium silicate 42° Bé, Grasselli Chemicals Dept. of the Du Pont Company.*



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Blends with Wool

The wool component of a blend of "Orlon" and wool can be bleached using a conventional wool bleaching process. For example, the material can be bleached for six hours at 120°F. in a bath containing 2·0% "Albone" 35 hydrogen peroxide and 0·35% tetrasodium pyrophosphate (TSPP). After the fabric is rinsed thoroughly, the "Orlon" can then be whitened by a formic acid-detergent scour.

Stripping and Levelling of Dyes

Strong oxidizing agents are required to strip completely either disperse or cationic dyes from "Orlon" staple. The stripped fibre can be redyed satisfactorily, but repeated strippings may reduce the affinity of the "Orlon" for cationic dyes. The fastness characteristics of stripped and redyed "Orlon" are about the same as those of dyed "Orlon" that has not been stripped.

Two different stripping formulations are given below, neither of which can be used on blends that contain animal fibres, such as wool. Animal fibres are dissolved by strong oxidizing agents.

Stripping with "Textone"

The material is treated for 45 mins. at the boil in a bath containing

5·0% "Textone"* sodium chlorite.
1·5% nitric acid (60%).

After stripping the goods are rinsed in a fresh bath. All traces of residual chlorine should be removed by scouring the goods with a nonionic detergent and tetrasodium pyrophosphate or treating with an antichlor, such as sodium bisulphite.

Caution: 10% of "Textone" is the maximum amount that is recommended for use at one time because of the corrosive effect on equipment.

This strip is effective on all of the cationic dyes with the exception of "Sevron" Blue 5G, which resists stripping with "Textone". This dye can be stripped with sodium hypochlorite.

Stripping with Sodium Hypochlorite

The goods are treated for 20 to 30 mins. at the boil in a bath containing

20% sodium hypochlorite (15% active chlorine).
3·6% acetic acid (28%) to adjust the bath to pH6.
20% sodium nitrate (added as a corrosive inhibitor for stainless steel).

* *Olin Mathieson Chemical Corp., Baltimore 3, Md.*

"Sevron" Blue 5G is stripped by this method, but is not stripped by sodium chlorite. As with "Textone" stripping, all traces of residual chlorine should be removed by scouring the material with a non-ionic detergent and tetrasodium pyrophosphate or by treating with an antichlor, such as sodium bisulphite. Sodium hypochlorite weakens or dissolves nylon connecting threads in sweater bodies of "Orlon." A limited amount of work indicates that strong cotton threads can withstand this bleaching treatment.

Partial Stripping and Levelling

There will always be a need for a means of salvaging dyed goods that are defective because of human errors or mechanical failures and for correcting dyeings which may come up too heavy or off-shade. The present methods for stripping 100% "Orlon," using "Textone" or sodium hypochlorite, are not applicable to blends of "Orlon" with wool. Hence, a different technique must be used; e.g., partial stripping or levelling.

Slightly shaded or streaked goods can be levelled or the shade can be weakened some 15 to 20% by the following procedure: The fabric is reworked for one to two hours at the boil in a bath containing

15·0% Glauber's Salt (calcined).
1·0% "Capracyl" Levelling Salt.
2·0% Du Pont Retarder LAN.
0·5% glacial acetic acid.

This procedure will not correct gross unlevelness.

Certain anionic surfactants are useful as partial stripping agents for cationic dyes on "Orlon". In general, these agents do not promote transfer or levelling of dye on the fibre, but merely hold in the dyebath the dye that is removed from the fibre. One of the most effective agents is sodium oleate soap flakes. By re-working the dyed fabric for about 2 hours in a bath with 10% soap flakes, as much as 75% of the dye that was originally on the fibre can be removed. Soap flakes are limited to a pH range of 7 to 10 and suitable water softening agents must be used in hard water areas. While this treatment is effective on goods of 100% "Orlon" and blends of "Orlon" with cellulosic fibres, it is not recommended for blends of "Orlon" with wool because of possible damage to the wool under these pH conditions. Compound No. 8-S and "Duponol" D Paste can be used under acid conditions, but are less effective than soap. After stripping, the "Orlon" is redyed to shade in a fresh bath.

If Du Pont Retarder Lan was used in the initial dyeing, much of it can be removed from the fibre by stripping with soap or an anionic surfactant. Both these treatments make redyeing to deep shades easier. Dye receptivity on "Orlon", that is lost by repeatedly stripping with "Textone" and nitric acid, can be partially restored by scouring the fibre with soap at the boil.

Chemical Finishes

Fabrics and yarns of "Orlon" staple can be made softer, stiffer, or water repellent by treating with the proper finishing agents. Some chemical finishes can cause skin irritation and sensitization. Consequently, it is important that each mill, for its own satisfaction and protection, check the toxicological behavior of each finishing agent that is used on "Orlon".

Resins.—To impart stiffness to fabrics of "Orlon", resin dispersions such as "Methacrol" FF, "Methacrol" NH and "Methacrol"FNH are applied by padding, followed by drying. "Methacrol" NH and "Methacrol" FNH can also be applied by exhaustion.

Silicone resins have excellent durability on "Orlon" and can be used to impart a range of fabric hands varying from crisp to soft. Combinations of a silicone resin and "Zeset" S fabric stabilizer have been used to impart durable "body" to blends of "Orlon" with rayon.

Melamine-formaldehyde or urea-formaldehyde resins used alone are not suitable for 100% "Orlon" since they impart a papery stiffness to the fabrics. These resins are removed both by dry cleaning and by washing.

Softeners.—Cationic softeners are substantive to "Orlon" and their use is widespread. Some of the agents that exhibit excellent softening properties on "Orlon" are: "Avitex" NA softener, "Avitex" NA in combination with "Methacrol" Lubricant K, "Ceranine" HC[1], "Velvetol" AF[2], "Sapamine"[3] and "Creamoyl"[4]. Although these agents are removed by dry cleaning or washing, the mechanical action of washing and wearing is beneficial and tends to improve the natural softness of "Orlon". Naturally, this compensates to some extent for the loss of the finishing agents.

[1] *Sandoz Chemical Works.*
[2] *Quaker Chemical Products Corp.*
[3] *Ciba Co., Inc.*
[4] *Scholler Brothers, Inc.*

The percentage of softener that is applied to yarns should be carefully regulated. More than one to two per cent. overlubricates the yarn and reduces yarn strength because of fibre slippage. Greater amounts can be used on fabrics.

"Zelan" AP Paste is a durable water repellent that softens "Orlon". It is applied by padding. After the fabric is dried, the "Zelan" is cured at 275° to 320°F. for two to four minutes. Curing makes the fabric slightly acid and leaves residual decomposition products. Therefore, the fabric must be neutralized by a wash with a suitable alkali and detergent. Concentrations of 0·05% "Duponol" D Paste and 0·1% soda ash are recommended at temperatures of 100° to 160°F. The fabric is then rinsed and dried.

As already noted, certain silicone resins can also be used as durable softeners for "Orlon".

Water Repellents

Fabrics of "Orlon" can be treated readily with standard water repellents. Such products as "Aridex" WP renewable water repellent, "Zelan" AP Paste durable water repellent and the silicon resins give "Orlon" excellent water repellency. "Aridex" is padded on, the pad liquor concentration being such as to add 2 to 4% of the repellent to the cloth. After impregnation the goods are dried in the usual manner.

"Zelan" AP Paste is applied as mentioned in the paragraph on softeners. Fabrics treated with "Zelan" have good durability to washing, but certain dry cleaning processes tend to reduce the effectiveness of this finish. Silicone resins such as "De Cetex" 104[5] are applied to fabrics of "Orlon" by padding. Two to 3% of the resin is padded on the fabric which is dried and then cured by heating at 275 to 300°F. for three to five mins. This water repellent has excellent durability to washing, but certain dry cleaning processes reduce its effectiveness.

Anti-Static Agents.—Various anti-static agents can be exhausted or padded on to fabrics of "Orlon". "Zelec" DX durable anti-static agent can be exhausted from a bath by adding "Avitex" FB anti-static developer. "Zelec" DP durable anti-static agent is applied by padding. Both these anti-static agents are durable to washing with soap. Certain dry cleaning agents and detergents render these anti-stats ineffective. However, their effectiveness is renewed by washing with soap.

Some non-durable anti-static agents, such as "Zelec" NK and "Zelec" NE, as well as many softening agents, such as "Avitex" NA, give temporary anti-static protection. The effectiveness of these agents is largely eliminated by scouring, laundering, or dry cleaning.

Mechanical Finishing

Various techniques have been developed for finishing fabrics of "Orlon" staple. The finishing methods should be chosen so that minimum tension is applied to the fabric when it is at elevated temperatures. The principles underlying this are shown in Fig. 1 which shows the tension required to stretch "Orlon" staple by 1% under various hot-dry and hot-wet conditions. For example, in water at 70°F., a tension of 0·43 grams/denier will stretch the wet fibre only 1%, but

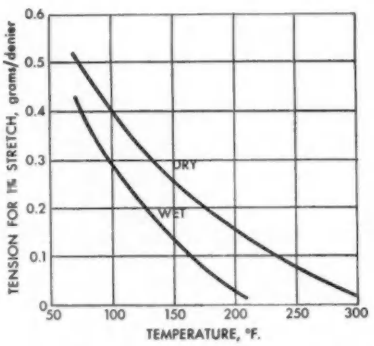

Fig. 1. Tension required to stretch "Orlon" Type 42 by 1%

at temperatures near the boil (200°F.), a tension of only ·0025 grams/den. will stretch the fibre 1%.

The tension per fibre and hence the percentage of fabric (or fibre) elongation that occurs in commercial dryers at a given temperature will be much lower than that for the single fibres in Fig. 1. The actual fibre temperature in commercial equipment is lower than the air temperatures indicated by the instruments.

In finishing fabric of high-bulk yarns, low fabric tension is necessary to permit maximum relaxation of the fibre and fabric, resulting in dimensional stability, maximum softness and fullness of hand. High mechanical pressures should also be avoided, especially at elevated temperatures, since glazing may result.

Fulling.—"Orlon" staple, by itself, shows no tendency to felt, and conventional fulling has no effect on fabrics of 100% "Orlon". As a result, the percentage of "Orlon" in a blend with wool affects the degree and rate of fulling. Where only a very light cover has to be produced by fulling, up to 70% "Orlon" can be used. Heavy cover requires a greater percentage of wool or mechanical napping.

Blends of "Orlon" and wool can be fulled under the same conditions used for all-wool fabric, without forming permanent wrinkles. A longer fulling time is required to approach or equal dimensional changes that occur with comparable all-wool fabrics.

The longer fulling time required for blends causes a slightly greater percentage of wool to be lost. To offset this, the allowance for wool lost during processing should be increased by 1 to 2%.

Blends of regular and high-shrinkage "Orlon" permit greater fabric shrinkage and better cover than is possible with regular staple only. High-shrinkage yarns are made by combining "Orlon" fibres of different shrinkage characteristics in the same yarn. One component has little or no residual shrinkage at temperatures near 212°F., while the other component has a relatively high shrinkage. For example, a yarn can be produced that contains 60% to 70% low-shrinkage fibres combined with 40% to 30% high-shrinkage fibres. When such a yarn is relaxed in steam or boiling water, either in yarn or fabric form, the high-shrinkage fibres shrink causing the low-shrinkage fibres to buckle. This increases the effective diameter of the yarn, giving it "loft" and bulk. To relax the high-shrinkage fibres and develop bulk the fabric must be subjected to temperatures of 205° to 212°F. in a relaxed condition. Piece-dyeing at the boil effectively relaxes high-shrinkage fibres.

Extracting

Vacuum extraction is the best way of removing excess water from fabrics containing "Orlon". Mangles and squeeze rolls can be used, but squeezing flatters the goods and may cause creases. Centrifuging can be used if the goods are completely cool when centrifuged. Otherwise, permanent creases are apt to be set in the goods.

Drying

Goods dried at open width, such as on an overfeed pin stenter, are soft,

[5] *Dow Corning Corp.*

have a desirable hand and are free of creases. The goods should be framed an inch or two wider than the damp width. Overfeed settings in the range of 4 to 8% are generally satisfactory. Both loop and "multipass air-lay"* drying are satisfactory if the goods are not folded or creased as they enter the dryer. For most fabrics, temperatures up to 250°F. are satisfactory if the fabric is not left in the heat chamber after it has completely dried. Relaxed drying usually gives satisfactory stability to apparel fabrics. If the goods are not fully stabilized by relaxed drying, steam sponging should be used to remove residual shrinkage. The finisher should always run appropriate shrinkage tests to determine whether adequate relaxation and dimensional stability have been achieved with a particular fabric style.

Other Treatment

Napping, etc.—Fabrics made from spun yarns of "Orlon" tend to have a nappy surface because of the inherent fuzzy nature of the yarns. If more nap or cover is desired, conventional card-wire napping machinery (Fig. 2) or teasel gigs can be used. If a clear faced fabric is desired, fuzz can be removed easily by shearing with conventional worsted equipment. Shearing can also be used in levelling the nap after fulling, napping, or gigging.

Singeing.—Singeing harshens the fabric hand because the ends of the fibres melt to form small globules. However, if singeing follows shearing, the harshening is so slight that it can usually be removed with a chemical softening agent. Shearing followed by singeing is one of the most effective ways of removing superficial fuzz. Singeing should be light and rapid so that only protruding fibre ends are burned or melted off. The fabric should be cooled before it is folded to avoid setting in fold marks. Running the fabric over a cold roll or skying is satisfactory.

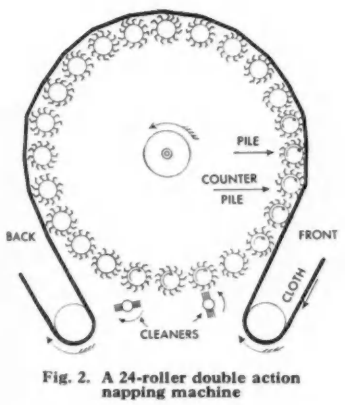

Fig. 2. A 24-roller double action napping machine

* *Proctor and Schwartz, Inc.*

Pressing.—Fabrics of "Orlon" can be finished on a rotary press, by using moderate temperatures and pressures to avoid shine. This treatment produces a supple hand, generally softer than that obtained by semidecating. Steaming before pressing helps to relax the fabric, removes wrinkles, and produces a more uniform moisture content.

In general, it is advisable to use mild conditions and a soft blanket in semi-decating any fabric containing "Orlon". Severe conditions can cause shine (excessive lustre), particularly in dark shades. Full decating is not generally used for fabrics of "Orlon" since it is likely to produce a boardy hand.

Reclamation of Waste Oil

USED on the Continent for many years the Schlegel system of refining used oil is now available in this country. Manufactured by Schlegel Brothers, Stuttgart, it is being handled in the U.K. and Eire by Liquid Systems Ltd., Norwich Union House, Wellesley Road, Croydon. Schlegel regenerators, which combine distillation, adsorption and filtration, work on a physical-chemical principle and can be operated by an unskilled operator after very short training.

The Schlegel Model M.A. has a capacity of 9·9 gals.

The operation is simple. First a small quantity of the refining agent, known as F.E., is put into the open regenerator and thoroughly mixed with the waste oil. The lid is closed and by means of a hand-pump or compressor the inside pressure is raised to approximately 36 p.s.i. Further processing will be completely automatic. The electric heating is switched on by the air pressure provided. The heat generated will, together with the refining agent, start off what is called a soft refining process by which oxidising products dissolved in the waste oil are separated. At the same time engine-created grit and other foreign particles are removed. The regenerated oil flows out of the regenerator in an even stream.

When the entire charge has been completely processed, the heating is switched off automatically and the regenerator does not require further attention. The residue remaining after the regenerating process is a dry compressed cake easily removed by a scraper in a matter of moments. Two small models, K.A. and M.A. (illustrated) have capacities of 3·3 gal. and 9·9 gal. respectively and larger models are available up to a maximum capacity of 88 gals.

Glass Fibre Sheet Development

Claimed to be one of the largest presses in this country devoted exclusively to producing glass fibre flat sheet, a press operating at the Permaglass Division of Permali Ltd., Gloucester, a multi-daylight unit, with automatic temperature control and high pressure hot water-heated platens, working at a pressure of 450 lbs./sq. in. The standard sheet produced measures 70 ins. × 34 ins. and more than 30 different grades using phenolic, melamine, polyester or epoxy resins combined with one of several different forms of glass cloth can be pressed to suit almost any application, although the six basic grades manufactured are said to cover most normal requirements. These are: polyester/fine or coarse weave (general electrical and mechanical); epoxy/fine or coarse weave (improved electrical and mechanical); phenolic/fine weave (chemical); melamine/fine weave (flame retardant electrical to Def. 5000).

New B.N.S. Director

Mr. H. Morris, commercial manager of British Nylon Spinners Ltd. since 1952, has been appointed to the Board as commercial director. Mr. Morris joined B.N.S. as commercial manager, at a time when the company was rapidly expanding its production of nylon yarns for clothing and industrial uses. B.N.S. is already the largest producer of nylon yarns outside the U.S.A. and extensions costing between £3 and £4 million now under construction at their Doncaster plant will lead to considerable further expansion of output during 1959.

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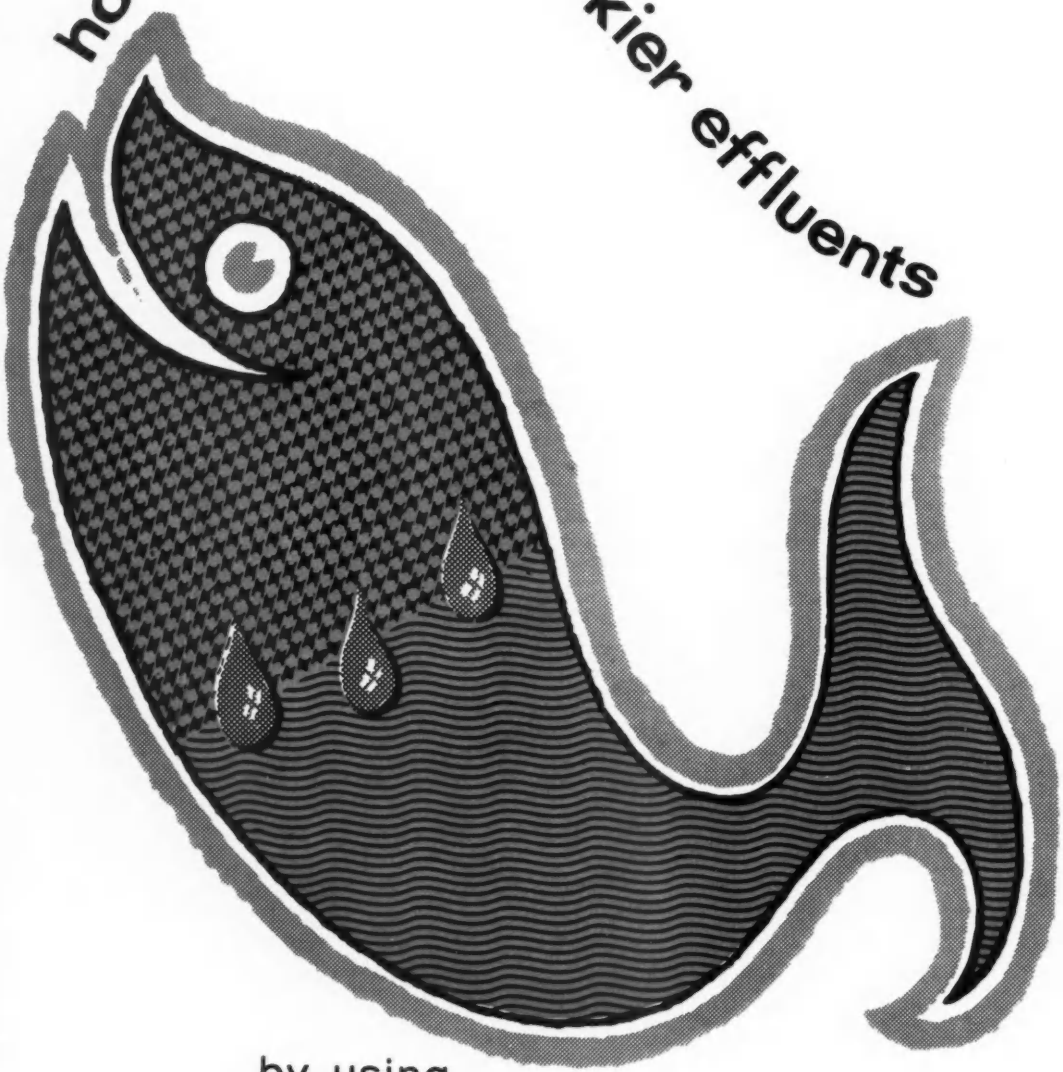

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Society of Chemical Industry

Preparation and Reactions of Nylon

BECAUSE polymers were often important for their physical properties, their behaviour as chemicals was sometimes forgotten, stated Mr. A. R. Munden, B.Sc., F.R.I.C. (British Nylon Spinners Ltd.) in a recent address to the Society of Chemical Industry at Cardiff. Confining himself to the simple linear aliphatic polyamides which contained a recurring group of the type $CO\ NH(CH_2)_x$. He pointed out that even in such a restricted group of compounds as this, many aspects of their chemistry could be overlooked.

There were many ways of forming a nylon by the condensation process, in the classical organic chemist's sense, all of them well known reactions in the chemistry of small molecules. He went on to illustrate the particular use of some of the reactions, viz: from an amino acid. from the salt of a diamine and a dicarboxylic acid and from reaction of a diamine with a dicarboxylic acid ester.

The methods of preparation of nylons could be summarised as follows:—

Nylon	*Reactions*
6·6	Condensation of salts of diamine and dicarboxylic acid.
6·2	Condensation of diamine and dicarboxylic acid ester.
1·6	Carbonium ion reaction of dinitrile and formaldehyde.
11	Condensation of amino acid.
6	Polymerisation of lactam.
4	Base catalysed polymerisation of lactam.
3	Migrational polymerisation of acrylamide.
2	Polymerisation of anhydrocarboxy-amino acid.

Mr. Munden said that in the preparation of nylons he had indicated by the breadth of chemistry involved, relationship to the conventional reactions of organic chemistry. In the reactions of these polymers once formed, a new factor came into play, the physical structure of the polymer. This largely determined mechanical properties and mechanical properties which were among the main selling features of most polymers, and the physical structure of a polymer was at least in part a function of its chemistry.

The chemical features involved might not be merely the main functional groups (in the case of nylons, the amine and carboxyl end groups and the amide links) but also molecular chain length and the results of side reactions in polymerisation, giving branching, cross-linking, oxidation, etc. These second order effects in chemistry might produce first order effects in physical structure. On the other hand, chemical reactions with a polymer were often carried out under heterogeneous conditions, where rates and even extents of reaction might be determined by the ability of the reactants and products to diffuse to and away from sites. So that the physical structure in time affected the chemical reactivity.

Mr. Munden then examined two aspects of physical structure, spherulitic crystallisation and molecular alignment. Spherulites were ordered structures, probably partly crystalline, partly amorphous, which grew radically in nylon (and in other polymers, too,) either when cast from solution or cooled from a melt under certain conditions. They were readily seen under the microscope in polarised light. Some spherulities formed around predetermined nuclei and could be melted, to re-form again in the same position on cooling. Such nuclei could arise from impurities present or formed during polymerisation. Increasing molecular chain length would retard spherulite formation; so, too, would cross-linking reactions. Molecular alignment was readily induced in fibrous nylons by the process known as cold drawing, whereby the molecular chains were more or less aligned along the fibre axis. Here decreasing chain length and increasing cross-linking retarded alignment.

Uptake of Dyestuff

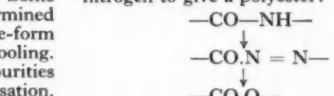
Discussing the reactivity of nylon and the way in which reactivity was affected by physical structure, Mr. Munden said that first, the amine and groups were responsible for the uptake of anionic dyes. The sulphonic acid groups formed a salt type linkage with the nylon, and with certain dyestuffs and conditions there was a stoichiometric relationship between dye uptake and amine end group content. If the amine end groups were acetylated, the uptake of anionic dyes were reduced or even completely prevented through removal of the dyeing sites. If the nylon was cold drawn, uptake of dyestuff was retarded, but in this case there was a reduction in rate only; if dyeing were continued long enough the equilibrium uptakes would be identical.

Anionic dyes would penetrate spherulitic structures so long as the normal acid conditions were used. Under neutral or alkaline conditions, however, only the non-spherulitic regions were dyed. This intriguing effect remained unexplained, probably because they knew so little about the internal structure of spherulites. Mr. Munden said that the amide links would undergo reactions through substitution of the amide H. Methylol groups might be introduced by treatment with formaldehyde and a catalyst. These methylol groups would readily undergo further reaction to produce methylene cross-links.

Treatment with both formaldehyde and alcohol with an acid catalyst introduced N-alkoxymethyl groups. The reaction could be carried out under homogeneous conditions, e.g. with the nylon dissolved in formic acid, or as a heterogeneous reaction with formaldehyde and alcohol in the vapour phase reacting with nylon impregnated with an acid catalyst. In the latter case it was possible to convert normal nylon fibres into elastic fibres. In the heterogeneous reaction, cold drawing would reduce the rate of reaction appreciably.

In 1955 E. H. White published a comprehensive study of the nitrosation of substituted amides. He demonstrated the efficiency of such nitrosating reagents as N_2O_3 and N_2O_4 and showed that the nitrosated amides were decomposed by heat. The nitrosation reaction did not take place so readily as the corresponding reaction with secondary amines: more intensive nitrosating reagents were required.

These reactions could also proceed with nylons. Complete nitrosation of 6·6 nylon could be effected with N_2O_3 in glacial acetic acid, or N_2O_4 in glacial acetic acid plus anhydrous sodium acetate. At temperatures of 80°C. or above the nitrosated nylon decomposed with evolution of nitrogen to give a polyester:



There was also some chain scission during the decomposition, probably because of reactions similar to those discovered by White leading to carboxylic acid and olefin formation. When the heating was rapid, the completely nitrosated material decomposed with a spectacular flash.

FAST TO LIGHT ACID DYES ON WOOL PIECE GOODS. Geigy Co. Ltd., Rhodes, Middleton.

A new feature of the company's recent pattern book (No. 523) is the method of displaying the colours in five graduated depths of shade. The book illustrates a selected range suitable for dyeing gaberdine and other wool materials to a high standard of fastness to light and perspiration. It includes descriptions of the colours and uses, and features a red/blue/yellow combination claimed to be outstanding for fastness, ease of application, and for the uniform dyeing characteristics required to ensure even build-up and good penetration.

U.S.A.: Jacquard Twine

Louis P. Batson Co., P.O. Box 772, Greenville, South Carolina, want to contact U.K. sources of supply for fine grade plied linen thread known as 20/20 jacquard twine. The company say that they usually purchase this material on spools containing approximately 1 lb. per spool, packed six spools per package. Suppliers interested should write direct to the U.S. concern, addressing correspondence to Mr. L. Batson, jr. Quotations should show both f.o.b. and c.i.f. Charlston, South Carolina, prices in U.S. dollars. Firms should also copy their correspondence to the British Consulate, 422 Hurt Building, Atlanta 3, Georgia 3, Georgia.

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Book Reviews

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS. N. I. Sax. Reinhold Publishing Corporation, New York. Chapman and Hall Ltd., 37 Essex Street, London, W.C.2 (price 180s.).

The phenomenal and, at times, frightening rate of technical and scientific development emphasises man's amazing and sustained capacity for logical reasoning but it also shows in stark relief the appalling limitations of human memory for storing masses of important knowledge. In fact, such is the pace of modern life that most everyday experiences in both work and leisure are quickly forgotten in the overwhelming rush of events and complexities accompanying each succeeding day. Clear recognition of this seemingly contradictory state of affairs makes it more important than ever to take whatever steps are necessary to ensure that technical and scientific works of reference fully meet the three-fold requirements of accuracy, in information, economy in searching time and, lastly, up-to-date in the presentation of every particular item.

This new book fulfils all expectations for, in 1,500 pages dealing with over 8,500 alphabetically arranged materials, it not only provides extremely valuable encyclopedic information on the hazards of general chemicals and industrial materials, but it also includes vital safety information in comprehensive text sections. This monumental volume is an entirely re-written and tremendously expanded version of the author's "Handbook of Dangerous Materials." Assisted by the wide experience of five other highly qualified experts he has provided a work of the utmost dependability on safety information. The usefulness of the general chemical section has been profoundly improved by listing under the appropriate elements the commonly used radioisotopes and the nuclear properties of each as well as the hazard potential of many of them. Detailed toxic hazard ratings are listed for the vast number of materials for which reliable data are available, and the toxicology of hundreds of industrially significant materials and classes of materials is discussed in detail. The fire, explosion and disaster hazard potential of all materials about which data could be obtained are also listed.

Other similarly important additions include an entirely new section on reactor safeguards as well as an enlarged section of text on radiation hazards in industry. Of paramount importance to the industrial physician is a valuable section on industrial toxicology and another concerned with allergic disease in industry. For the industrial hygienist and safety officer, sections are included on the control of industrial hazards, personnel protection and air pollution in addition to sections on fire and explosion hazards and the storage and handling of dangerous materials. An up-to-date section on I.C.C. shipping regulations exclusive of container specifications included in next to the last section is especially interesting to traffic managers and warehousemen. Meticulous in every detail, this remarkable book should be in the technical section of every town and city library, in all hospitals, every works and in all university and technical college libraries. The price is amazingly cheap for the wealth of information it makes available to humanity in general, in an easily followed arrangement of subject that most people will understand without difficulty.

A.D.

* * *

REVIEW OF TEXTILE PROGRESS. Vol. 8. Published by the Textile Institute and Society of Dyers and Colourists. (price 42s., members 33s.)

The eighth annual review of textile progress brings again proof of the great activity in research and industry. The review continues to follow its well-set pattern, and it is satisfactory to observe that the joint edition committee is anxious to enlarge the scope of the review by introducing special articles and by inviting experts for contributions in their special field. This year one of the special contributors is Chanoine J. Pinte (Centre de Recherches de la Soierie et des Industries Textiles, Paris) who writes on silk and reports an increase in the production of the world production of raw silk (1955: 27,000 metric tons; 1954: 24,000 metric tons). He also mentions recent studies of the correlation between certain morphological characteristics of the cocoons and the final spinning products.

In another special article D. C. Shaw (Cotton Board) compares the structure and organisation of the cotton and rayon industry in Britain with some of the other textile producing and exporting countries. His observations and conclusions are very interesting. There is less integration between spinning and weaving in Britain than anywhere else except Japan and, possibly, Belgium. Single-shift working is almost universal in the British industry, but since this paper was written a number of firms have adopted two-shift working. Three-shift working is the rule in the U.S. and Hong Kong, and is extensively practised in India. The new feature having articles on economics is very commendable and should be continued in future volumes.

The bulk of the book brings surveys of studies and publications in spinning, weaving, knitting, dyeing, printing and finishing textiles; with sections on analysis, chemical and physical testing, laundering and dry cleaning. In the chapter on industrial applications of textiles H. O. Puls (B.N.S.) records increasing interest and uses of all types of textiles. Cotton still holds a major place while high-tenacity viscose rayon forms the backbone of the great tyre cord industry. Nylon has already become an important competitor in the tyre industry, sharing the American tyre market with 16% in 1956, particularly in aeroplane and tractor tyres, but there is already considerable infiltration of nylon into the lorry, bus and passenger car market.

In their review on colouring matters J. E. Bloor and A. R. Thompson (Manchester College of Science and Technology) mention that it is most appropriate that the introduction of an entirely new type of reactive dyes, the Procion dyes (ICI) coincides with the centenary of the discovery of the first synthetic dyestuff. F. V. Davis (James Hardcastle & Co. Ltd.) and Dr. C. B. Stevens (Leeds University) in the chapter on dyeing discuss the application of Procion dyes to cellulosic fibres, and their suitability in continuous dyeing methods. They also review the progress in dyeing synthetic fibres, dyeing triacetate, and the many papers on dyeing acrylic fibres, where disperse and basic dyes are the most useful.

It is a most interesting, in parts even fascinating, book. As before, the index is very well compiled.

B.S.

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CHEMISTRY. By M. J. Sienko and R. A. Plane. McGraw-Hill Book Co., McGraw-Hill House, 95 Farringdon Street, London, E.C.4 (price 50s. 6d.).

Assuming ever increasing importance with the accelerated rate of scientific progress the subject of chemistry knows no bounds and becomes far more complex as new experiences and knowledge probe further into unknown spheres. Based on lectures given in an introductory course at Cornell University, the authors' approach to the compilation of this extremely valuable book has been to assume that the reader has little or no previous knowledge of the subject. It is a bold attempt which succeeds admirably but, not only that, it also forms a reliable and fascinating reference work.

Consisting of two main sections, Part 1 is devoted to establishing the fundamental principles of chemistry at their present stage of development. Beginning with the isolated atom, the authors discuss the nature of the chemical bond and the states of matter, and culminate with chemical kinetics and chemical equilibrium. Sufficient material is given on water, hydrogen and oxygen to establish a basis for an atomic model of matter. Hydrogen, oxygen and water are again dealt with in the second part of the book but in the framework based on the principles previously established. Other elements are accorded similar treatment and the authors proceed from left to right through the periodic table because the chemistry of alkali metals is relatively the simplest, and because group similarities are the most pronounced.

Difficult topics, e.g., stoichiometry, hydrolysis, etc., are given extended treatment and in dealing with organic chemistry the authors have stressed those aspects which will give the student a good introduction to the subject. Recent advances presented on a student level include: atomic spectra and quantum levels, magnetic properties, wave mechanical descriptions of the atom, deviations from ideal behaviour of gases, lattice structure and lattice defects, photosynthetic mechanism, radio-carbon dating, theory and utilisation of nuclear energy. Questions at the end of each chapter enable the student to test whether or not he has absorbed the lessons explained, and a detailed cross-referenced index complete a valuable addition to the literature of this endless subject. A.D.

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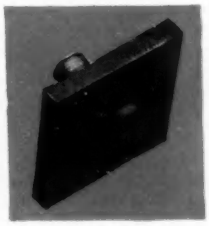
MAN-MADE FIBRES. By R. W. Moncrieff. National Trade Press Ltd., London. (price 65s.).

The author's book "Artificial Fibres," first published in 1950, with its second edition in 1954, is now available in its



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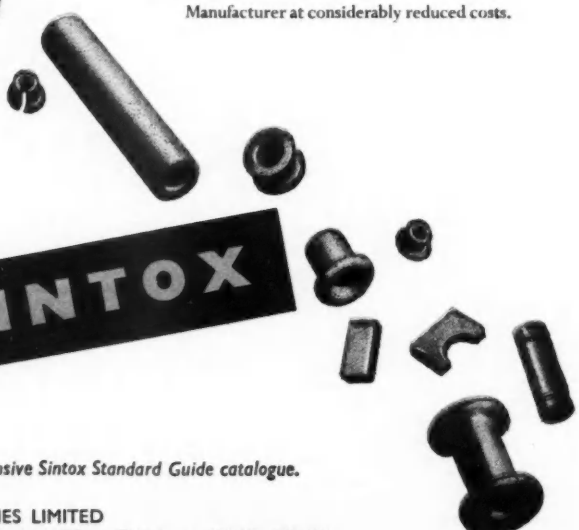

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third edition called "Man-Made Fibres." The change of title was essential as the term artificial fibre has become obsolescent and it is now usual to refer to cellulosic and synthetic fibres as man-made fibres. The new edition has been revised and expanded from 313 to 661 pages and, in view of recent developments, it includes new chapters on cellulose triacetate, on chemically modified cellulose fibres, and the section on synthetic fibres has also been considerably enlarged. In the previous edition "Terylene" was dealt with in two pages only, there are now twenty-five pages on this fibre, and there are also separate chapters on acrylic fibres, on the Japanese polyvinyl alcohol fibres, Vinylon and Kuralon, there is also more to say about Dynel, and on some of the other and newer synthetic fibres. This section of the book ends with a chapter on metallic yarns, their chemical nature, manufacturing methods, properties and uses.

The section on processing comprises a description of textured yarns, and of stretch and bulked yarns; the author deals also with the manufacture and properties of staple fibre, with non-woven fabrics, with dyeing methods for loose fibre, and yarns, with special sections on high-temperature pressure dyeing, and with continuous dyeing methods for fabrics. Methods for the identification and estimation of man-made fibres by the burning, staining and solubility test, also their microscopical examination, are listed in an instructive table.

At the end of the book, the author expresses his views on the economic and social aspects of man-made fibres, and their impact on the older fibres. Production figures for each fibre are given, and whereas in 1951 the synthetic fibres accounted for much less than 1% of total fibre production, they now represent already a good 2%. In 1951 they accounted for some 5% of man-made production, and they now represent 15%, with a steady upward trend. Although, in the opinion of the author, viscose and acetate will continue with further developments of high-tenacity fibres, he predicts a further expansion of protein fibres (at the time of writing termination of the "Ardil" production had not been announced), and polyamides, polyesters, acrylics and other synthetic fibres will increase in their uses, alone or in blends with natural and other man-made fibres.

An alphabetical list of nearly 500 commercial man-made fibres from 20 different countries is published as an appendix. There are literature and patent references after each section, and to the bibliography at the end "Technology of Synthetic Fibres" by Samuel B. McFarlane (Fairchild Publications, Inc., New York, 1953) should be added. Altogether this is a very comprehensive and authoritative publication and an indispensable reference and text-book.

B.S.

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ALLGEMEINE STANDARDWERTE FUER DIE UNGLEICHMAESSIGKEIT IN DER BAUMWOLLSPINNEREI. Issued by Zellweger A.G., Uster, Switzerland. Published by Melliand Textilberichte, Heidelberg, Germany. (price DM 5).

This monograph on general unevenness standards in cotton spinning applies to electronic unevenness testers equipped with electrical integrators, particularly to the Uster Unevenness Tester. It revises and supersedes previous standards published in 1952.

Standards of irregularity in terms of "mean linear irregularity," "coefficient of variation" and "high-low range per yard" all expressed as percentages, are detailed for scutcher lap, sliver lap, sliver, roving and yarn. Card, comber and drawframe sliver, roving and yarn standards are given in detail. In each case, typical unevenness traces are given showing even, average and below average material, while charts classifying neppiness and extreme range values (the "Hy-Lo Test") are provided.

B.S.

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BEOBACHTUNG UND MESSTECHNISCHE ERFASSUNG DER VORGAENGE IM SPINNUND AUFWINDEFELD VON RINGSPINN-UND RINGZWIRNMASCHINEN. (Observations on Ring Spinning and Twisting Machines). By H. Stein. Institut f. textile Messtechnik, M.Gladbach. Forschungsbericht No. 378. Westdeutscher Verlag Köln & Opladen. (price DM 26.90).

New types of instruments for measurement of thread tension were used to elucidate the performance during one rotation of the traveller on a ringframe and to measure the actual yarn tension during that interval. Observations were also made about wear of ring and traveller. It would appear that there is practically no dry friction between traveller and ring, but that in order to obtain satisfactory conditions a lubricating film must be present. With rings which have no additional lubrication, the yarn itself takes care of this by means of wax, grease, oils, etc., contained in it. It is shown that specially formed travellers—in which the point of contact of the thread is varied—give superior results.

B.S.

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PHYSIKALISCHE UND CHEMISCHE EIGENSCHAFTEN DER WOLLE, VON DER GEWASCHENEN WOLLE BIS ZUM KAMMZUG. (Physical and Chemical properties of Wool From Scoured Wool to Wool Comb). By D. G. Satlow. Forschungsbericht No. 433. Westdeutscher Verlag, Köln & Opladen. (price DM 15.25).

This is a report of a large investigation concerning physical and chemical changes in the structure of wool during processing and use. In this particular study wool combing was examined and tests made on washed wool, as starting material, on the various segregated parts and on combed wool. The tests comprise moisture absorption, fibre fineness, fibre length, breaking strength, extension at break, oil content, loss on washing, and various other chemical tests. Special chemical tests were the determination of the cystine content, solubility in urea bisulphite, in alkali and acid, as well as paper chromatography and tension tests.

B.S.

* * *

UNGLEICHMAESSIGKEITEN IN BAENDERN VON BASTFASERKARDEN, IHRE URSACHEN UND AUSWIRKUNGEN. (Irregularities in Carded laps of Bast Fibres, Their Cause and Effects). By W. Rohs & R. Otto. Forschungsbericht No. 397. Westdeutscher Verlag Köln & Opladen. (price DM 14.80).

Carded laps of flax and hemp fibres show irregularities in thickness which are not periodic although they repeat in a characteristic form. In this investigation carded laps were produced by varying the feed, carding proper, and drawing. A textronograph was used to measure the variations in thickness. It was found that feeding must be uniform to produce regular laps. Pre-carding was of no avail, and changes in roller speed were not effective. Correct setting of doffers was important. The work is documented by many diagrams taken with the recording textronograph.

B.S.

* * *

TEXTILE IMPORTS AND EXPORTS, 1955-6. H.M. Stationery Office, Kingsway, London, W.C.2. (price 48s.).

Produced and available as two separate volumes at 12s. each, these form part of a series of statistical publications on the textile industry, and are the result of research undertaken in recent years by a special Working Party of the O.E.E.C. textiles committee. The two provide a wealth of statistical data on foreign trade in textile commodities of O.E.E.C. member and associate countries. Mainly intended for international comparisons, standard definitions are used wherever possible as a common basis for the various reporting countries.

Trade Literature

CELLOPHANE WRAPPING. The Autumn edition of "Merchandising Vision," published by British Cellophane Ltd., 12-13 Conduit Street, London, W.1, contains several interesting applications of this versatile transparent wrapping medium. This issue states that to improve handling and distribution, more and more manufacturers are bulk-packaging retail units in "Cellophane" film thus cutting the cost of outer wrappers, simplifying handling and identification and giving added display value and protection to their products.

* * *

"TERYLENE" FISH NETS. "Terylene" is now used for gill, trawl and seine nets and is available from most leading net makers in the U.K. and many overseas countries. A four-page leaflet outlining the unique properties which "Terylene" offers the fishing industry is now available on application to I.C.I. Ltd., Fibre Div., Harrogate, Yorks.

* * *

ALUMINIUM COURIER. Aluminium Development Association, 33 Grovenor Street, London, W.1. Articles included in a recent number of this well illustrated publication cover several varied and interesting subjects. Among these are: "Heat exchange equipment," "Aluminium in nuclear engineering," "Arc-cutting aluminium," "Aluminium rainwater goods" and "New welding standards."

* * *

MUIRHEAD SYNCHROS. A broadsheet from Muirhead and Co. Ltd., Beckenham, Kent, presents the salient characteristics of

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their synchros, servomotors, resolvers, motor tachometers and tachometer generators at present in production. The information is arranged for easy reference, and forms a useful key to the more detailed information contained in the Muirhead synchro data sheets.

* * *

1957 ANNUAL REPORT: CHEMSTRAND. 8 Waterloo Place, London, S.W.1. The report states that the "Acrilan" manufacturing plant at Coleraine, N. Ireland, will begin operations towards the end of 1958. In 1957, sales of "Acrilan" were up by 183% over 1956. Nylon sales rose by 29%. Production capacity of the "Acrilan" plant at Decatur, Alabama, was increased from 30 million lbs. to 45 million annually whilst the nylon plant at Pensacola with an original annual capacity of 50 million lbs. can now produce 114 million.

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ANNUAL REPORT, 1956-57. The Council of Industrial Design, Design Centre, 28 Haymarket, London, S.W.1 (price 1s. 6d). The three main events of the year were the successful opening and operation of the Design Centre for British Industries in Haymarket, London, the 1956 Design Congress and the 1957 British Furniture Exhibition staged by the council at the industry's invitation. All three point to the increasing interest by British manufacturers in the importance of industrial design. Other sections of the report deal with home and overseas exhibitions, retail activities, education, record of designers and press relations.

* * *

INDUSTRIAL RUBBER NEWS. An article of interest to textiles appears in a recent issue of Goodyear Industrial Rubber News," published by Goodyear Tyre and Rubber Co. (Great Britain) Ltd., Wolverhampton. Entitled "Keeping Ahead with Man-made Fibres" the article deals briefly with the transmission systems employed in the weaving shed of John Woodrow and Sons Ltd.

* * *

DRY FILM LUBRICANT. A leaflet announcing "Everlube" a new dry film lubricant is available from Stedall Machine Tool Co., 145-157 St. John Street, Clerkenwell, London, E.C.1. The lubricant is a fused-to-the-part compound, composed of resins blended with certain pigments: graphite, metallic salts, and molybdenum disulphide. Advantages claimed for it are that it is unaffected by extreme heat, solvents or vacuums, can be heavily loaded, run dry or used with oil or grease and will not blister, crack or peel.

* * *

ELECTRICITY IN INDUSTRY. A recent number of this monthly technical review published by the Lancashire Dynamo Group comprises four main articles: "Combined Maximum Reading Ammeter and Clip-on Current Transformer," "Minister of Power Opens new Office Block," "New Smoke Densitometer," and "The Manufacture of Transductors."

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FOAM BACKED FABRICS. The Natural Rubber Development Board have just reprinted in pamphlet form an article entitled "The Use of Polyglycol H.S.35/40 in the Manufacture of Latex Foam." It describes a new method of production particularly suited for the application of latex foam as a backing to fabrics and carpets. Details of compounding and processing are given.

OVERSEAS ECONOMIC SURVEY — IRAN. H.M. Stationery Office, Kingsway, London, W.C.2 (price 5s. 9d., post free).

About three-quarters of the cotton piece goods sold in Iran are cheap calicos, a market in which the U.K. cannot compete against countries where labour costs permit low selling prices. The remaining quarter consists of better quality fabrics with British exporter's prospects somewhat better, although price is always important. Intense Japanese and French competition in the cheaper woollen and worsted price ranges caused a fall in U.K. exports: £1,121,000 in 1954 down to £793,000 in 1956.

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OVERSEAS ECONOMIC SURVEY — BURMA. H.M. Stationery Office, Kingsway, London, W.C.2 (price 4s. 7½d. post free). On the overall trade figures for 1954-55 and the first half of 1955-56 U.K. was the leading supplier with nearly 25% of the total imports by value. Burma's membership of the sterling area coupled with the presence of British manufacturers on the Burmese market for many decades helped U.K. to retain this lead. However, import restrictions the past two years have meant a serious decline in U.K. exports and the lead is threatened by India, Japan and West Germany. This trend is indicated in textiles due to intense Japanese and Indian competition.

* * *

ELECTRICITY IN INDUSTRY.—Lancashire Dynamo Group Publicity Services, St. Stephen's House, Victoria Embankment, S.W.1. A recent issue of this technical review contains four main articles. These are concerned with recent developments in the field of variable speed drives, rolling bearings for small motors, vehicle battery charging and transformer core steel. The latter article is one of a series which, in this issue, covers methods of use and processing of high-grade transformer core steel.

* * *

STORAGE HEATING. A leaflet announcing three types of storage heating is available from the British Electrical Development Association. It is claimed that storage heating is the most economical method of electric space heating, having the advantage of using electricity when the demand for power is small, and storing up this energy in the form of heat to be released slowly when electricity is most in damand.

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EKCO NUCLEONIC GAUGES. A liberally illustrated brochure has recently been released by Ekco Electronics Ltd., Southend-on-Sea, Essex. It provides descriptive information on the various types of gauge in this particular range, discusses their application in industry and briefly elucidates the principles of non-contact measurement.

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OVERSEAS ECONOMIC SURVEY—NIGERIA. H.M. Stationery Office, Kingsway, London, W.C.2 (price 10s. 0d.). This recent Nigerian survey is in eight sections and furnishes a wealth of information relative to political progress and development, finance, commerce, industry and transport. The work is thoroughly executed and should prove invaluable to any company visualising commercial intercourse with the colony. Statistics, included in the survey show that the U.K. is both Nigeria's best customer and principal supplier. Although more goods imported from the U.K. have accounted for a large part of the increase in total import trade, recent years have been marked by the emergence of strong competition from West Germany over a wide range of goods and a phenomenal increase in Japan's share of the trade, particularly in textiles.

* * *

YEAR BOOKS AND DIRECTORIES WHO'S WHO. Publishing and Distributing Co. Ltd., Mitre House, 177 Regent Street, London, W.1 (price 5s.). Several hundred annuals, directories and press guides of the world go to make up the contents of this very useful index. Arranged in alphabetical order and giving number of pages and price of each, it should prove invaluable to export manager, librarians, sales promotion departments, etc.

* * *

BUYERS REFERENCE LIST.—Apparel and Fashion Industry's Association, 92 New Cavendish Street, London, W.1. This twenty-first issue showing dates in London and the provinces has been issued to principal buyers in the U.K., to overseas buyers, British and foreign commercial posts overseas and to overseas Press. The list contains information on many of the fashion houses in London and includes a special section in which details of more than 60 firms are recorded. The special export catalogue issued still remains an important guide to the British wholesale fashion market.

INTERNATIONAL MODEL 1958. World's Press News Publishing Co. Ltd., 9-10 Old Bailey, London, E.C.4 (price 21s.).

This is an entirely new venture of interest to organisers of fashion and textile shows, providing a "casting directory" for over 300 models, mainly British. The publishers hope that in the next edition the international coverage will be considerably extended. Photographs of all the mannequins and photographic models are accompanied by their "vital statistics" and the choice of suitable men and women is made easier by the provision of an index which classifies according to sex, size and broad age-groups in addition to listing fashion commentators and character models.

S.P.S.

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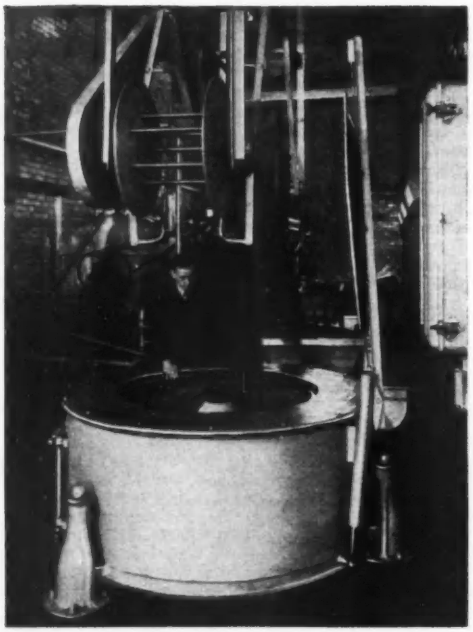
ZUR DICHTEBESTIMMUNG VON FASERN (Determination of Fibre Density). By Dr. J. Juilfs. Forschungsbericht No. 381. Westdeutscher Verlag, Köln & Opladen. (price DM 17).

This monograph describes a new method of determining the density of fibres. It was considered that the published figures vary considerably probably as a consequence of insufficiently accurate determinations. Apart from the density of dry fibres, that of wet fibres was studied and the degree of swelling determined in this manner. Finally, fibres which had been treated in various ways were examined, such as viscose rayon treated with acid, cuprammonium rayon from various spinning methods, resin treated fibres, etc. Tests were also made with fibres from streaky viscose and acetate rayon having different dyeing properties. Significant variations in density were observed. Many diagrams and tables are included in this interesting paper.

B.S.



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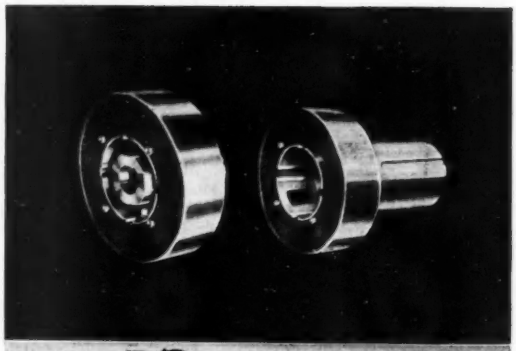

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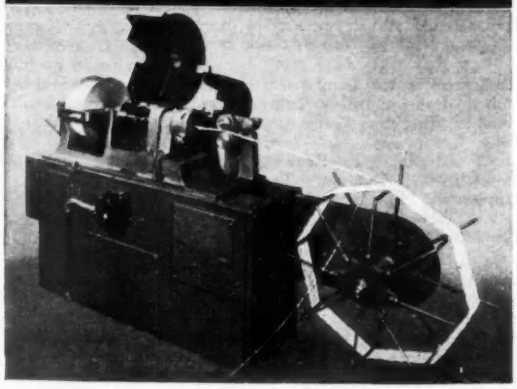

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Western Germany:
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Herr August Sommer, Osberghausen (Bez. Koeln), is interested in representing U.K. suppliers of animal hairs suitable for the manufacture of carpet yarns, in particular goat hairs sorted in the colours white, black and beige; East Indian hair wool (yellowish/reddish); North African hairs and Madras hairs.

Established in 1921 as a commission agent dealing in textile raw materials, has been in the trade 40 years and was at one time works manager of a shoddy mill. He holds agencies of well-known German and Dutch firms. Suppliers interested should write direct, also notify the British Consulate-General, Cecilien Allee 16, Dusseldorf.

Western Germany:
Everyman Import Scheme

With certain exceptions, any person or firm within the federal republic of Germany can import by post goods to the value of DM.100 (about £8. 10.0.) without formality or licence. Several German firms and individuals are interested in representing as agents or otherwise U.K. firms who may consider setting up an organisation in Germany to handle this business. The names are: Jedermann Liliput Einfuhr G.m.b.H., Unterlindau 20a, Frankfurt am Main; F. Reese, Unterlindau, 45, Frankfurt am Main; Hjalmar-Rolf Kaiser, Lindemannstrasse, 1, Dusseldorf; K. Klaus, Langestrasse, 18, Hagen; W. Wetzel, Buro fur "Jedermann-Einfuhren," 78/79 Hauptstrasse, Berlin-Friednau.

Further information about the Everyman Import Scheme can be obtained on application to B.o.T., Export Services Branch.

Israel:
Duck Fabric

Mr. H. Fraidlin of Agricultural Service and Supply, 6 Feirberg Street, Tel Aviv, wishes to receive quotations from U.K. manufacturers for the supply of 20,000-25,000 yds. of duck. He says his client who has previously been supplied from U.S. sources, will be placing his order within a few weeks. He is not sure of the prices offered from U.S. sources but expects them to be in the region of $2.25-$2.50 per yard. Whilst the specification given is 38 in. width he thinks other widths would be acceptable. Agricultural Service and Supply were established in 1955 with the object of dealing in agricultural equipment, fumigation of grain, etc. Manufacturers interested should send samples and quotations (f.o.b. U.K. port) direct also together with an indication of the rate, notify the British Embassy, Commercial Secretariat, 192 Hayarkon Street, Tel Aviv.

Western Germany:
Carpets, Furnishing Fabrics

E. A. Stellmann and Co., Dusseldorf, Im Rottfeld, 23, wish to contact U.K. suppliers of high-quality, exclusive carpet lines, in through-woven, high pile weaves. They are also interested in good quality soft furnishings: cotton or staple fibre damasks, chintz, printed cretonne or linen. Established in 1894, are commission agents dealing mainly in hair carpets, upholstery and furnishing fabrics and for some years represented U.K. manufacturers of carpet body goods and curtain tulles. No stocks are held, materials being delivered direct by the manufacturers. Suppliers interested should write direct, also notify the British Consulate-General, Cecilienallee 16, Dusseldorf.

U.S.A.:
Leather and Cotton Webbing

Gusto Manufacturing Corp., 710 S. Main Street, Tifton, Georgia, want to contact U.K. sources of leather and cotton webbing used in manufacturing of safety belts for infants. The following details have been supplied:—

Leather.—5/6 glazed sides; white, russet and brown.

Cotton Webbing.—½ and 1"—maize, pink and blue. Suppliers interested should write direct and quotations should show both f.o.b. and c.i.f. prices in U.S. dollars, also copy their correspondence to the British Consulate, 422 Hurt Building, Atlanta 3, Georgia.

Libya:
Woollen Suitings

Mr. A. Gean, 30-32 Sharia Omar Mukhtar, Benghazi, would like to contact U.K. firms manufacturing woollen suitings. He has been established since 1936 as a dealer in textiles, and suppliers interested in selling suitings in Cyrenaica should write direct, also notify the British Embassy in Libya, Commercial Secretariat, Sharia Omar Scennib 15-17, Benghazi.

Italy:
Woollen Rags

Mr. F. S. Booth, Corso Venezia 37, Milan, would like to represent U.K. exporters of woollen rags. He is a British subject and has been in business in Milan since 1946 as a representative, on commission basis, for exporters of cotton waste, rags and allied lines. He holds a U.K. agency for cotton rags and cotton waste and has a sales organisation covering the whole of Italy. Suppliers interested should write direct, also notify the British Consulate-General, Commercial Section, Via Gabba 1A, Milan.

Panama:
Marine and Fishing Equipment

Maritima Roparo, S.A., Apartado 616, Panama, R.P., is a company interested in obtaining U.K. agencies for marine and fishing equipment. Suppliers interested should write direct, also notify the British Embassy, c/o British Consulate, Box B, Balbao Post Office, Canal Zone, Panama.

Cuba:
Linen Fabrics

Loquin and Castellanos of Villegas 413, Havana, are anxious to obtain U.K. agencies for linen fabrics. Formed in 1957, they are commission agents handling mainly textile piece goods. Suppliers interested should write direct, also notify the British Embassy, Commercial Secretariat, Apartado 1069, Havana.

Western Germany:
Furnishings and Carpets

The firm of Joseph Koch GmbH., Dusseldorf, Am Wehrhan 1/5, want to contact U.K. suppliers of soft furnishings: specifically printed linen, cretonnes, chintz and gripper carpets. They are interested only in traditional designs and in the case of carpets reproductions of genuine Persian patterns. Established in 1890, it is a department store specialising in textiles of all kinds located in the centre of Dusseldorf. They are members of the central buying organisation "Rhein-textil," Koln, and employ about 640 persons. Suppliers interested should write direct, also notify the British Consulate-General, Cecilienallee 16, Dusseldorf.

Canada:
Upholstery etc., Fabrics

Stock Ramsey and Associates, 2041 Hamilton Street, Regina, would like to receive samples and literature concerning upholstery and drapery fabrics. They are architects and consulting engineers and interested manufacturers should write direct to the company.

Australia:
Queensland Development Mission

The Queensland Government is sending a mission to London to draw attention to their plans for development and to explore the prospects for local manufacture of U.K. goods. The mission will study development areas in the U.K. with a view to introducing, if appropriate, similar facilities for industry in Queensland. The mission will be headed by the Hon. K. J. Morris, M.L.A., Deputy Premier of Queensland and Minister for Labour and Industry. Other members will include the Federal President of the Associated Chambers of Commerce of Australia and the President of the United Graziers' Association together with industrial and banking representatives. The Mission will be in London April 8, and will arrange visits over four weeks to various industrial centres in the U.K. Firms or organisations wishing to meet the mission should write to the Agent-General for Queensland, Strand, W.C.2, suggesting when a visit might be arranged.

correct light for colour matching—£25

For matching dyes, fabrics, pigments or products of any kind where colour enters into the specification, you need a special type of light. But it needn't cost you a lot of money. The Siemens Ediswan Industrial Colour Matching Unit gives you an unvarying source of artificial daylight of high luminous intensity for only £25. The spectral quality of the light from this unit is almost identical with that of natural daylight at a colour temperature of 6500—7000°K. The shaped reflector and 24 x 17½ in. diffusing screen spread the light evenly over the working area and there is a remote control that switches off the fluorescent tubes for matching colours by incandescent light only. The unit is supplied ready to operate directly from the 200/250 volt 50 cycle supply. Total consumption is 220 watts. We will gladly send you a folder describing in detail the unit and its method of use.

INDUSTRIAL COLOUR MATCHING UNIT TYPE FTF 2444

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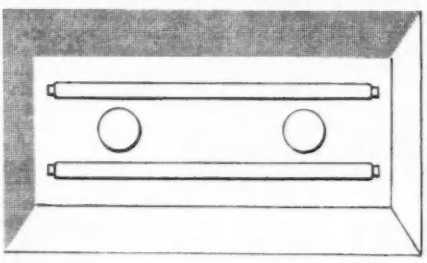
SIEMENS EDISON SWAN LIMITED

LAMP & LIGHTING DIVISION,
38/39 UPPER THAMES STREET, E.C.4.
DISTRICT OFFICES AND BRANCHES
THROUGHOUT THE COUNTRY.



Complete with control gear, lamps (2 filament and 2 blue fluorescent), remote control box and 2 yd. 7 core cable.

PRICE: £25

This price includes Purchase Tax on lamps

CRC PD 11

Textile Trade and Prospects

Short-Time Working in Cotton

Conditions in Lancashire spinning and weaving circles show no improvement and, if anything, the position is worse than it was a month ago. Demand for yarn and cloth remains disappointingly poor and inquiry in all counts is almost as bad as it can be. Occasionally there is a little spurt in one or two lines but the orders are very small with accent on early delivery. Some slight revision of quotations in Egyptian-type yarns during the month did nothing to improve the position. Buyers are still reluctant to operate in view of the prevailing uncertainties in raw material values. Short-time working in certain parts of the hosiery industry has had repercussions in the finer end of the spinning trade. At the moment more mills, and mule and ring spindles are stopped than for a long time. There is no consistent pattern in the short-time working; coarse as well as medium and fine mills are affected. Adverse developments in the Middle East are also to blame for some of the worries afflicting managements in respect of raw cotton, and the situation in the U.S. is not much brighter. In the sales recorded, medium yarns of standard weaving qualities have been in modest request. Combed counts and, at the other extreme, coarse numbers are only poorly supported. Blended yarns are in reasonable demand but those using a 60/40 proportion or 75/25 m.m. and cotton are only available in limited weights. Condenser yarns manage to find consistent support.

The position in cloth is no better and merchants and shippers are only operating on a very sparing scale. The rate at which order books are running down has become alarming. At this time of the year many firms are usually well booked in anticipation of spring and summer trade but, although stocks of manufactured goods are low, there is little apparent eagerness on the part of buyers to begin operations on anything like a substantial scale. Of the very limited transactions, dress cloths in a wide range of dobby and jacquard designs have formed the bulk of business. Blended cloths have met fair support and screen and machine printed styles in attractive designs in dress and furnishing cloths have been accorded moderate interest. Certain specialities have been readily taken-up, but these are exceptions few and far between. Industrial cloths are moving slowly and prospects of early delivery fails to arouse enthusiasm. Export business is extremely scrappy with limited sales to one or two Commonwealth and Continental markets. Imports of cloth into the U.K. from the East continue on a substantial scale despite representations to the Government from all sections of the industry. Indifference to this vital problem during the past two years is now showing itself in the short-time working, in addition to the number of mills permanently closed and scrapped. The effect of the latest news from Australia completes a depressing picture.

Wool Consumption and Prospects

World wool consumption during 1957, estimated by the Commonwealth Economic Committee at 2,855 million lb. (clean weight), compared with 2,853 mill. lb. in 1956, is an increase of 1% and sets up a new record for wool. While the U.K. continues to use far more wool than any other country—her total for last year was 481 mill. lb. (clean)—the estimates of the committee show that the most outstanding increase last year was that of 27% achieved by Italy. A further substantial improvement of 9% was recorded by Japan and it is possible that final figures will show that country to have replaced Western Germany as fourth largest consumer in the free world after the U.K., U.S.A. and France. In France and the U.K., usage last year rose by 7% and 1% respectively, but in the U.S.A. there was a fall of 15% to the lowest annual total since 1938. There were reductions also in Belgium and the Netherlands amounting to 1% and 7% respectively.

The 1957 totals for France, Japan and possibly Western Germany set up new records in each case. Consumption in the rest of the world in 1957 is tentatively estimated to have risen by about 1% compared with 1956. On the basis of available supplies of raw wool, consumption in the Soviet Union, China and Eastern Europe increased by less than 1%, a rise in domestic wool production off-setting a decline in imports. The committee points out that the rate of increase in world wool consumption was slowing down during the first three quarters of 1957 and that, during the final quarter, aggregate consumption by the 11 major manufacturing countries of the free world was 10% lower than a year earlier.

Britain's wool leaders are optimistic about the industry's future. At the recent annual meeting of the British Wool Federation in Bradford the atmosphere of the wool market was described as "much more buoyant." At another recent meeting, that of the West Riding Worsted and Woollen Mills Ltd., the chairman, Sir John Keeling, found some encouragement in the outlook. Of the wool industry he said: "My personal view is that when we recover from the malaise from which world trade is suffering, conditions will be much healthier than they have been in recent years."

The new president of the British Wool Federation, Mr. A. D. Blackburn, commented after his election: "There are pointers in the present position which justify optimism." The retiring president, Mr. W. W. Early, said that the wool trade was not yet "out of the wood" and, although there was much for which to be thankful, there was still a good deal of instability in the outlook. "Even so," he said, "it seems to me that the uncertainties of the present and future position have been largely discounted in the present price level."

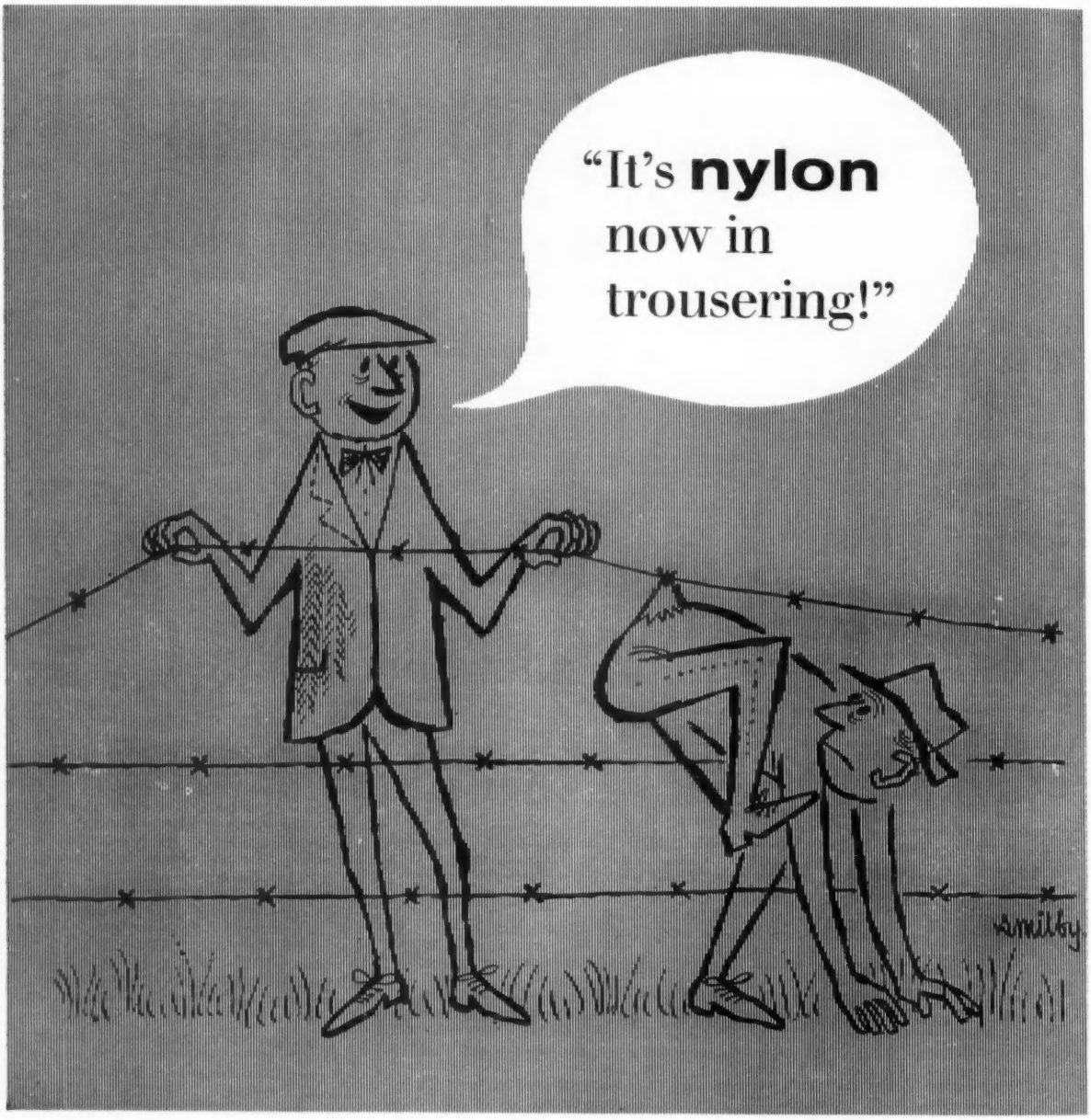
Commenting on economic conditions in the U.K. which had led to a planned de-stocking by wholesalers and retailers of wool textiles, Mr. Early said this had produced a chain re-action back to the raw material. He believed this movement had been over-done and that national employment, wage levels, spending power and exports did not warrant such hesitance. Today, he said, with the wool season well advanced, there was a much more buoyant atmosphere in the market.

Linen Trade Review

With 1958 now well under way and demand for the products of the industry showing little evidence of the expansion usually experienced at this time of year spokesmen for the trade, and executives in the manufacturing and merchanting sections, are concerned over the cause of delay. Even a brief survey of trends in supply and demand indicates how the pattern of world textile production and consumption has changed in recent years. Following a natural development through agriculture to industry many long established and valuable overseas markets have now attained a considerable measure of self sufficiency in their textile requirements, while the rapidly expanding range of man-made fibre textiles has encroached seriously on markets formerly exclusive to one or other of the established natural fibre industries.

While the early tendency was to look on these new fibres as rivals, or at best as short term allies to tide over periods of raw material shortages, economic necessity enforced a more permanent alliance which has proved highly advantageous to both the natural and man-made fibre industries. In the immediate post-war years a substantial percentage of the linen industry's total output comprised rayon staple fabrics, the yarns for which were mostly supplied by the spinning section. The progressive decline in demand for stapled man-made fibre fabrics produced on the flax system has been due to lack of diversity, and that element of novelty so necessary to maintain consumer interest.

Granted that this system of yarn production has its limitations, nevertheless it is obvious from a study of the products of other sections of the textile industry processing similar staples and deniers to those used by flax spinners that the possibilities in this direction are by no means exhausted. There are still too many diehards in the trade who think only in



Embarrassment can be avoided—by manufacturers as well as the trousered public—if the cloth is a judicious blend of nylon and another suitable fibre. Stronger, lighter, easy to make and swift to sell, nylon-blend cloths stand the full treatment from men who are hard on clothes and from boys who are boys. Our technical people have studied the tougher trousering problem from every possible angle. Consult them any time you like.

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terms of flax and its products, and expect the consumer to do likewise.

Quiet conditions ruling in the manufacturing section are reflected in the raw material markets. The balance of the home grown crop has now been disposed of. Supplies are still coming forward on the principal Continental markets though the volume is diminishing in some classes. There is little evidence of bulk buying. Spinners' representatives and merchant houses are selective in their purchases and there is not much give and take in the matter of price.

An air of uncertainty exists in both home and Continental flax producing centres regarding the future. Producers maintain that, at current market values, flax production is uneconomic. Advancing production costs have met with a progressive decline in market values. A critical point has now been reached with a seemingly insoluble problem. One factor, however, is clear and from it the solution—if one is possible—must be derived. Consumer interest is the determining factor of demand and selling price, which is also related to the selling price of competitive textiles. This must cover marketing, manufacturing and raw material costs, the extent of allocation should be a matter for joint consideration and not determined, as at present, by the "beggar my neighbour" policy, which has been largely responsible for the progressive decline in the industry of this country. Let us hear less of appeals for State aid—to bolster home flax production: to re-equip mills and factories: and to push the sale of our linen goods in world markets—and more of concrete co-operative action by all sections of the industry to make it competitive at home and abroad.

Replying to a question in the N. Ireland House of Commons the Minister of Commerce, Lord Glentoran, stated that thirty-seven textile firms, employing a total of 3,100 operatives, which made returns for the Government census of production in 1949, have ceased to do so because they have closed down or have been taken over by larger firms, or else had become too small to be included in the census.

Installation of the most up-to-date machinery and the introduction of double or treble shift working was suggested as the real answer to competition from other linen producing countries by Mr. Frank Hughes, textile officer of the Amalgamated Transport and General Workers Union, when he addressed a meeting of the National Council of Labour Colleges in Belfast. He expressed the opinion that the industry would benefit to a greater extent by cultivating the home market than by expending so much effort and money on overseas markets faced with competition from Czechoslovakia, France, Switzerland, Japan and Hong Kong.

Man-Made Fibres and Fabrics

Lancashire trade, although quiet, is not lacking in inventiveness, and an indication of some of the development work deserving special mention is a new recently introduced range of cotton and rayon mixture denims for the leisurewear purposes. Traditional cotton denims have for some years been used for slacks and children's playsuits but the new range, while retaining the tough, hard-wearing qualities of traditional denims, has a much more attractive appearance and handle and because of its smoother texture must obviously be more comfortable in wear. The main innovation is a spun dyed continuous filament high tenacity rayon yarn used as weft across a cotton warp. The weft is similar in strength to the high tenacity viscose used so successfully in the tyre cord trade and being spun dyed means it has an extremely high standard of fastness to light and washing. The new cotton and rayon denim is being produced in two-colour or iridescent effect which is expected to prove popular for modern style beachwear at British and Continental resorts this year.

Demand for rayon dress fabrics is fair in the crease-resist cloths and in the new non-stretch, non-shrink furnishing fabrics which have been selling so well. There is plenty of activity in Yorkshire sections with the worsted trade quite healthy and reasonable interest being shown in woollens for both the men's and women's trade. Some particularly interesting furnishing constructions are now being produced and expanding use of effect threads is helping to turn out some remarkable cloths. There is a good call from the Midlands trade for spun nylon yarn and the knitwear industry has not slackened its demand. Macclesfield trade is by no means brisk and screen printers are finding things quiet and activity in machine printing is not much better. Throwsters are reported active, with steady demand in the Midlands for the bulked yarns. Demand exceeds available supply and machine builders in the area are well booked for orders for this type of machinery. In Leek area, business is very good in certain types of knitted goods, but advance buying for the summer is somewhat disappointing. Trade in most classes of knitgoods incorporating the acrylic fibres is fairly good and certainly more promising than for some time past. Smallwares trade is none too brisk, and most classes of narrow fabrics are selling rather slowly.

If demand for jersey fabric is reported to have fallen slightly, there is a good call for most types of knitted fabrics. Increasing use is being made of blends of cotton and nylon, and for men's and ladies' underwear this blend is developing rapidly in the better-class ranges. Men's knitted half-hose is in keen request in spun nylon and spun "Terylene." In the ladies' trade, the continued development of seam-free stocking is reported, and fully-fashioned hose still sell well with extremely competitive margins.

Jute Fibre, Yarn and Fabrics

Raw jute markets, weak since the start of this year, became more noticeable recently and prices of all grades of the fibre were further reduced. Lack of any sustained demand is the main reason for this position, but the Pakistan authorities are doing their utmost to prevent prices falling to a lower level, by maintaining fairly high E.P.C. price levels. However, despite this action in Pakistan, many shippers are offering at under the official minimum price level but this has not brought out much additional buying interest. Taking a broad view of the position there does not appear to be any sound reason why prices of Pakistani jute should fall to any great extent, because it must be remembered that the present crop was restricted to give an out-turn only sufficient to meet world requirements. The portion of the crop yet to be marketed is in strong financial concerns with no reasons why they should not be able to retain their holdings until demand improves. There have been rumours that business has already been transacted in new crop to both the Continent and the U.K. on the basis of £91 for Mill Lightnings. Due to the nature of the present jute crop, excess lower grades have been produced. This has affected prices of low class raw material and fairly large consignments have been made to various countries.

Offers of Mill Firsts and higher grades are still scarce but there may be some improvement in the position towards the end of the present season. Other grades are freely offered and there appears more pressure to sell. During the past month U.K. spinners have not purchased their cut-up and this has shortened the raw material position. However, this was only to be expected due to the easier trend in raw jute prices in Pakistan.

Some shippers are asking as much as £117 for Mill Firsts and Mill Lightnings are at £94, Mill Hearts at £83 and grade Hearts at £71, c.i.f. U.K., Feb./Mar. shipment. Grade Tossa-2/3 is at £102 10s., and grade Tossa-4 at £95 with crack Daisee-2/3 at £95 and grade Daisee-2/3 at £87, c.i.f. U.K., Feb./Mar. Some of the smaller shippers are asking more than the above rates because of the fear of loosing their trading licences by transacting business at under the E.P.C. price level. Spinners generally are uncertain and the policy at present appears to be to purchase small weekly quantities.

At the beginning of February the Calcutta goods market was steady, but this position quickly changed and prices of hessians and heavy goods began to fall. Demand from the U.K. has not been large and mainly confined to 10 oz. 40 ins. material. Quotations are at 59s. 9d. for 10 oz. 40 ins., and at 45s. 5d. for 7½ oz. with 11 oz. 45 ins. at 66s. 3d. per 100 yds. f.o.b. Calcutta for February shipment. B. twills were quoted at 154s. February.

Demand for yarns and cloth in Dundee is disappointing. Consumers are operating only in the near delivery position with practically no interest shown forward. Supplies of most yarns can be obtained for immediate delivery with buyers content to purchase weekly needs. The carpet trade which has been taking regular delivery for some time and was the one bright feature in the spinning end, has now in some instances reduced its offtake due to restrictions by New Zealand on imports. The full effect resulting from a reduction in the mark-up price of imported Asiatic jute goods which was brought into force last year has not been felt by the U.K. yet but the position is serious enough. There is no doubt that the credit squeeze and the high bank rate has been felt by Dundee spinners and manufacturers as consumers of yarns and cloth are refusing to hold stocks of any size and are buying in a hand-to-mouth fashion.

The Scottish linen trade is also feeling a drop in demand. This has taken place despite the fact that prices of linen are cheap in comparison to most materials. Up till now production has been kept at a fairly high level but lack of orders, especially in the heavy end of the industry is creating idle machinery. Raw material prices still tend lower and although yarn prices were reduced at the end of January it did not increase business.

Roll it on

and roll 'em off

Prevent bottlenecks in your production line with Quick-Wrap Hessian Tubing. This new idea in packing is three to five times faster than hand sewing and can be used by any unskilled worker. All the packer has to do is pull the hessian tube over the package; fasten either end with a wire tie; then cut the tube above with a sharp knife. Quick-Wrap Hessian Tubing saves at least 50% labour costs. And you actually use about 33% less hessian because it stretches and moulds itself so well to the product. There's no wastage as tubes can be used over again. Products look smarter, too, packed this way and are easier to open.

Write for free demonstration and our leaflet which gives full details of this new packing idea.

ELEVEN SIZE WIDTHS TO SUIT ALL PRODUCTS

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Notes and News

Textile Testing Equipment

At a textile testing exhibition organised recently by the Midlands branch of the Textile Institute at the Leicester College of Technology, Shirley Developments Ltd., introduced the prototype of the new "Shirley" crimp tester. This is more versatile than its predecessor being available either with a 2 ft. or with a 4 ft. body, produced to meet the requirements of the hosiery industry. The price of the new instrument has been drastically reduced following on Shirley Developments' policy of modifying designs to reduce costs without affecting accuracy or reliability. Among other items on show which also aroused interest were the "Shirley" yarn friction recorder, the "Shirley" general purpose yarn friction tester, the "Shirley" moisture meter and a working model of the "Shirley" ampli-dry dryness indicator.

Patents Rules

Minor changes in the arrangements governing patents applications and fees have been laid before Parliament by the Board of Trade. They include the introduction of a new service to the public by which information will be supplied as to whether any particular patent is in force on payment of a nominal fee of 1s. for the first patent and 6d. for each succeeding one. This service will replace the former annual publication of the "List of Patents in Force". The new rules, Patents Rules, 1958 (S.I. 1958 No. 73), came into operation February 1, 1958, and can be obtained from H.M.S.O., price 2s. 6d.

Australian Wool

Australia's wool cheque for the first five months of the current season, from July to November was £A171 million, an increase of £A12 on the corresponding figure for 1956. The weight of wool sold was nearly 27 million lb. greater. Japan displaced Britain as the chief buyer of greasy wool from Australia in the five month period, the value of Japanese purchases being £A32,500,000. The figure for U.K. buying was £A500,000 lower. France bought wool to the value of £A27 million, about the same as in the previous period. American purchases were unchanged at £A3 million.

Sprayed Asbestos

SPRAYING asbestos fibres directly on to a structure or building fabrics is a process with great potentialities. It is widely used to combat condensation, provide thermal insulation, give fire resistance, exclude dust, and in some types of building, to correct accoustical effects. Sprayed asbestos is well-suited for insulating practically all classes of industrial buildings. By this method (called sprayed "Limpet") specially treated asbestos fibres are projected simultaneously with a fine water spray from a multi-jet spray gun. Various grades of asbestos fibres are used to meet certain essential functions. The resultant mixture is pliable for two hours, during which time the surface can be flattened or shaped and becomes set in about eight hours. The advantages claimed for sprayed asbestos include the following:

Thermal Insulation.—With a single skin roof, savings in fuel consumption of 50% have been achieved. Buildings insulated this way can be kept at a lower temperature and still provide the same degree of comfort.

Anti-condensation.—Condensation is prevented by maintaining the surface concerned about dew point. The applications are capable of absorbing many times their weight and this is later evaporated when average conditions are re-established.

Fire Protection.—The system complies with the requirements of the Fire Research Station fire tests. Data is available which shows the exact degrees of fire resistance when applied to concrete floors, steel beams and columns.

Dust Exclusion.—By providing an unbroken and reasonably flexible internal line the sprayed "Limpet" seals all the laps and joints. In that way it effectively stops dust and dirt coming through roofs and, occasionally, walls.

Spraying of "Limpet" asbestos is carried out by Turners Asbestos Cement Co. Ltd., Trafford Park, Manchester, on a contract basis anywhere in the U.K.

New Chelating Agent

Potential uses of a new chelating agent, Versenex 80, introduced by Dow Chemical Co., Midland, Michigan, U.S.A., include the control of iron contamination in peroxide bleach baths and control of iron and other heavy metals that degrade finished polymerized latex. Versenex 80 differs from other Versene products; it is based on diethylenetriamine while the latter are based on ethylenediamine. Dow recommends Versenex 80 in cases where metal-ion control by other Versene products has met with only borderline success.

Glycerol Formal

Brotherton and Co. Ltd., are now offering Glycerol Formal, said to be an excellent solvent (for cellulose acetate) with a very high water tolerance. Glycerol Formal, previously produced on the continent under the trade name Sericosal N, is also of particular interest to the textile printing industry. Samples and data, etc., are available from the manufacturer at P.O. Box 6, Leeds 1.

Anti-Static Treatment for Textiles

A process for modifying the properties of synthetic fibres, in particular for reducing their tendency to accumulate a charge of static electricity, comprises treating the fibres with a condensation product of from one to three molecular proportions of a fatty acid with one molecular proportion of glycerine previously condensed with from 3-40 molecular proportions of ethylene oxide. (Austral. Appln. 25,720/57.)

Light-Coloured Alkyd Resin

A light-coloured alkyd resin prepared from glycerine and drying or semi-drying oil fatty acids derived by hydrolysing the oil with lipase is described in Japanese Patent No. 2696. For example:

Fatty Acid	100 parts.
Phthalic Acid	80-150 parts.
Glycerine	40-60 parts.

are heated together for several hours at 230-270°C. in an atmosphere of carbon dioxide. The resultant alkyd resin has an acid value of 6.

Wool Scouring Method

The wool fat is extracted with a solvent, preferably hexane and the wool is then washed with 0·5-1% of its weight of a non-ionic detergent in aqueous solution at room temperature. Preferred non-ionic detergents include octylphenol or octylcresol condensed with 12-14 mols. of ethylene oxide, and glyceryl monostearate. By this process the wool is left neutral, the wool fatty acids are easily recoverable by acidifying the washing solution and the potassium salts from the suint are recoverable by cation exchange. If the washing solution is subjected to both anion and cation exchange it may be recycled to the scouring process. (B.P. 766,762).

Colours for Next Winter's Wools

Brilliant new colours for wool are shown in the British Colour Council's wool card for autumn and winter 1958. Scientists who in past years have worked to improve dyeing methods for wool will welcome this wonderful range. It shows how great was the recent advance which permitted the effective use of vat dyes on wool.

One set of colours grouped under the heading "Spanish Holiday" includes flamenco red, picador blue, majolica orange, Spanish moss, Sevilla blue and persimmon orange. All are rich and vivid.

In another section "From the Mountain Heights," winter violet tones through alpine violet into deep shadow blue, and through blue wonder and Medici blue the deep and subtle shade of distant pine is reached. There are 33 wool colours in all. Among others are vista and pewter grey, caber tan, foam green, loganberry, radiant red, harness tan and moon blue.

New Paper Laminates

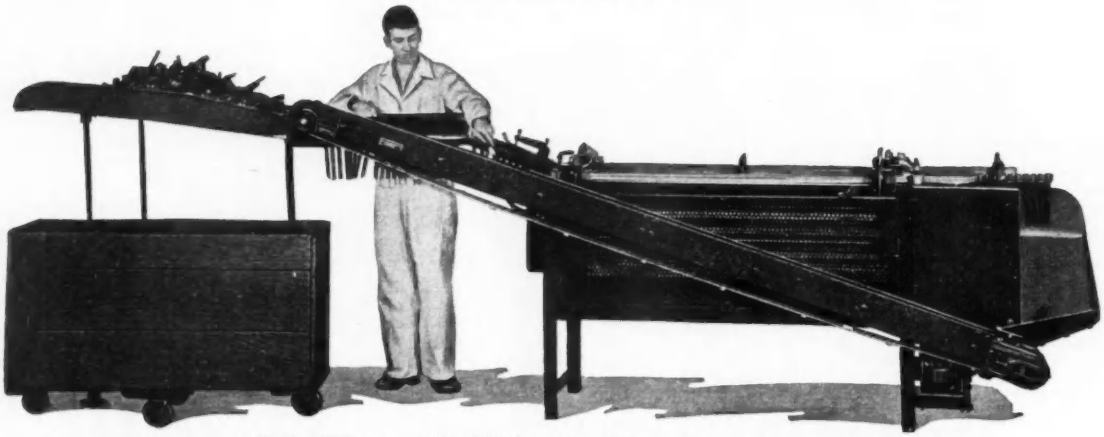
A range of laminates combining paper, polythene and hessian have been developed by the Plastics Division of Telegraph Construction and Maintenance Co. Ltd., Mercury House, Theobald's Road, London, W.C.1. By the extrusion coating technique, a hessian mesh is firmly sealed to paper with a layer of polythene which covers the mesh completely. The result is a material said to be strong mechanically and proof against moisture. By varying the mesh, the type of paper, and the thickness of the polythene layer, different laminates can be made to suit individual requirements. Where the best possible retention of mechanical properties in damp conditions is required, paper of high wet-

WHY RISK IT?

ALL MECHANICAL PIRN STRIPPERS TEND TO HARM PIRNS EVEN IF CAREFULLY MAINTAINED AND OPERATED. FAULTY PIRNS RESULT IN FAULTY CLOTH.

THE TERRELL PNEUMATIC PIRN STRIPPER CANNOT HARM PIRNS, BECAUSE ONLY COMPRESSED AIR TOUCHES THE BARRELS. IT IS VERSATILE, EASY TO OPERATE, AND VERY INEXPENSIVE TO MAINTAIN.

You ought to get one.



Made by **THE TERRELL MACHINE CO. INC., Charlotte, N.C., U.S.A.**

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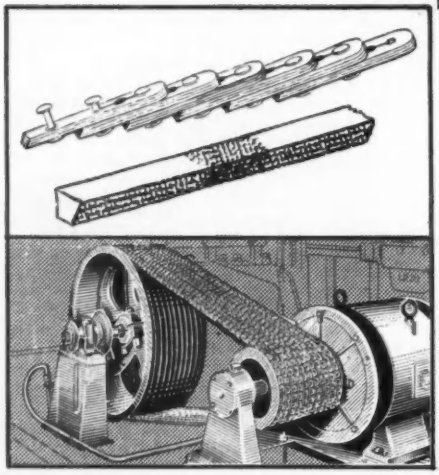
Sole Agents in Great Britain and many European countries, etc.

N.B. A simplified model is now available for the small mill and a semi-automatic installation is now available for the large mill.

the end to endless trouble



Brammer V-Link Belting is built up of detachable and inter-changeable links, to form a belt of any required length.

This unique construction eliminates fatigue, the chief cause of failure of solid Vee Belts.

Ease of joining up eliminates costly dismantling of machinery, bearings, shafting, etc., when fitted.

Brammer V-Link Belting in action is a demonstration of Vee Belt efficiency.

For economy, fit Brammer Vee Link Belting for all your Vee Belt Drives.

BRAMMER

Vee-Link Belting

H. BRAMMER & CO. LTD., HUDSON RD., LEEDS 9

strength is used. The varieties at present being offered are:—

(*a*) 36 ins. wide hessian (3 ozs./40 ins.) laminated with 0·003 in. of polythene to wet-strength creped Kraft, 38½ ins. wide, on one side.

(*b*) 36 ins. wide hessian (3 ozs./40 ins.) laminated with 0·003 in. of polythene to wet-strength Kraft, 38½ ins. wide, on *both* sides.

(*c*) 36 ins. wide hessian laminated with 0·002 in. of polythene to U.G. pure Kraft, 38½ ins. wide, on both sides. This is produced with hessian of 1½ ozs. or 2 ozs. weight per 40 ins.

The De Witt Smith Medal

American Society for Testing Materials Committee D-13 on Textile Materials will present the Harold De Witt Smith memorial medal to Dr. S. J. Kennedy, research director, Textile, Clothing, and Footwear Division, Quartermaster Research and Development Centre, Natick, Mass., U.S.A. The presentation will be made during the spring meeting of Committee D-13, March 18-21, at the Sheraton-Park Hotel, Washington, D.C. The medal is a testimonial to the memory of the late Harold De Witt Smith who did so much work on the evaluation of the properties of textile fibres and to their utilization. It was endowed by Fabric Research Laboratories, Inc., Boston, and is awarded by Committee D-13 for outstanding achievement in research on fibres and their utilisation. Dr. Kennedy has had a distinguished career in the service of the U.S. Army Quartermaster Corps during World War II and subsequent thereto. His service with the Quartermaster Corps began in 1942, when as Lieut.-Colonel, U.S. Army, he became chief, Textile Section, Research and Development Branch, Military Planning Division, O.Q.M.G. In this capacity he initiated the Q.M. programme of research and development in the field of textiles and successfully sought and utilised the co-operation of the textile industry, foremost scientists, and laboratories in the designing and development of improved clothing and shelter for American soldiers. Since the war, Dr. Kennedy has continued with the Q.M. Corps as Research Director, Textiles, Clothing, and Footwear Division, first in Washington and from 1954 to date in Natick, Mass.

Colour for Children's Wear

Details of the new colour ranges for 1958-59 children's wear are now available from the British Colour Council, 13 Portland Square, London, W.1, through membership of the Council's Children's Wear Division. The prevailing trend for brighter colours is reflected in the 24 new colours, six each for wool, knitwear, cotton and silk and man-made fibres.

Nylon in Industrial Spheres

The five principal end products to be shown by British Nylon Spinners at the Industrial Textiles Exhibition, Royal Albert Hall, London, April 14-18, all illustrate how nylon is being used to produce equipment capable of standing up to severe modern conditions. Tarpaulins made from proofed nylon fabrics with tremendous strength include some made from the new polyurethane-proofed fabrics. Light in weight and flexible, they are easy to handle, impermeable and rotproof. Conveyor belting, with a nylon weft, used in British coal mines for several years past, includes new types based on extra-high tenacity nylon yarn. The belting has longer life under severe coal face conditions.

Ropes include some of the large sizes such as used for mooring and ocean-towing. Some are made from the extra-high tenacity yarn. Fishing nets are giving nylon ever-increasing scope. In addition to gill nets nylon is going into several other types of netting to provide fishermen with more powerful weapons to keep up with changing conditions. Tyres for aircraft and, more recently, earth-moving vehicles and lorries have now been followed by tyres for private cars. Nylon tyres lose little strength when wet, cannot rot and have tremendous shock resistance.

Durazol Turquoise Blue GR I.C.I. Ltd., Dyestuffs Division

This direct dyestuff gives brilliant blue shades of high light fastness on cotton and viscose rayon. Similar in dyeing properties to Durazol Blue 8G, it has somewhat superior wet fastness properties, possesses good solubility and level-dyeing properties, and is suitable for dyeing all forms of cotton and viscose, including dress goods and other fabrics on jig and winch, and viscose cakes and other packages in circulating-liquor machines. Durazol Turquoise Blue GR will be of particular interest for dyeing mode shades, e.g., turquoise blues, also in combination with Durazol Yellow 6G, Durazol Yellow 4G or Durazol Flavine R, for bright greenish/yellow shades.

Durazol Turquoise Blue GR is notable for the bright greenish/blue shades it produces on natural silk from acid dyebaths. Attractive shades with very good wet fastness properties are also obtained on nylon. In the wool field, use of this dyestuff is restricted to the dyeing of loose wool and slubbing for the production of bright greenish/blue shades of high light fastness. It is also of interest in printing, producing bright shades on cotton, viscose, wool and natural silk.

* * *

Textile Exhibition Chairman

The new chairman elected for the international textile machinery exhibition to be held at Belle Vue, Manchester, in October, is Mr. A. E. Aspinall, managing director of Livesey and Aspinall Ltd., Manchester, who have represented the Swiss firms of Schweiter S.A., and Vollenweider Ltd. for over 30 years. Heis also managing director of A. E. Aspinall Ltd., representing Whitin Machine Works, Crompton and Knowles, Gebr. Staubli and Co., and E. Frolich Ltd.

New Companies

Industrial Yarns Ltd. Private. Reg. Sept. 26. Capital £250,000 in £1 shares. Manufacturers, dyers and finishers. J. Barnett, Marlow, Crewe Road, Sandbach, Ches., and W. E. Whiston, M. A. Tatton, H. W. Johnson, W. D. Dwyer, D. G. Mulcahy, R. D. Lord.

W. and N. McQuaid Ltd. Private. Reg. in Dublin, October 21. Capital £5,000 in £1 shares. Manufacturers, importers and exporters, wholesale and retail dealers in textile fabrics of all kinds, etc. William J. McQuaid, textile manufacturer, and Mrs. Noreen McQuaid, both of 38 South Avenue, Mount Merrion, Co. Dublin.
The first directors are not named.

Stroud, Riley (Irish Exporters) Ltd. Private. Reg. Dec. 19. Capital £10,000 in £1 shares. Manufacturers of textile materials, buyers, combers, doublers, preparers, weavers, and dealers in wool, silk, cotton, hair, etc. The subscribers (each with one share) are: Miss Marie Griffin and Miss Eimer Gantly, both of 11 Anglesea Street, Dublin.

Harry Rose and Son Ltd. Private. Reg. Dec. 19. Capital £1,000 in £1 shares. Importers and exporters of rags, fents, and textiles, etc. H. Rose and D. M. Rose. Registered Office: Green Street Mill, Green Street, Werneth, Oldham.

Stanley Walker and Son Ltd. Private. Reg. Dec. 20. Capital £10,000 in £1 shares. Top, noil and waste merchants. S. Walker and E. M. Walker. Registered Office: 12-14 Adelaide Street, Bradford.

Mountain Blending and Willeying Co. Ltd. Private. Reg. Dec. 23. Capital £1,000 in £1 shares. R. W. Suddards and D. M. Garside. Registered Office: 69 Market Street, Bradford.

Highfield Knitting Co. Ltd. Private. Reg. Dec. 24. Capital £1,000 in £1 shares. Manufacturers of knitted fabrics and garments, etc. A. H. M. Barker and P. W. Skinner. Solicitors: S. J. B. Thomas and Co., 49 Derby Road, Long Eaton.

Company Number 2 Ltd. Private. Reg. Jan. 1. Capital £500 in £1 shares. Manufacturers and weavers of crepe and fancy yarns. R. Blum and D. Fletcher. Solicitors: Percy Heibert and Burden, Hyde.

A. M. Hulme Ltd. Private. Reg. Jan. 2. Capital £2,000 in £1 shares. Manufacturers and dealers in textiles. A. M. Hulme and Mrs. J. L. A. Hulme. Registered office: 3 Marsden Street, Manchester 2.

Kirk Mills (Textiles) Ltd. Private. Reg. Jan. 2. Capital £1,000 in £1 shares. Manufacturers of cotton, rayon, silk, wool, etc. J. R. Kirk and A. M. Hulme. Registered office: 3 Marsden Street, Manchester 2.

Wildon and Co. Ltd. Private. Reg. Jan. 6. Capital £1,000 in £1 shares. Objects: To carry on the business of spinning or Manufacturers in cotton, wool, nylon, etc. A. Wilson and Mrs. H. Wilson. Registered Office: 2 John Dalton Street, Manchester 2.

Swan Fabrics Ltd. Private. Reg. Jan. 7. Capital £5,000 in £1 shares. Woollen and worsted manufacturers. H. Higgins and T. W. Hill. Registered Office: 87 Swan Arcade, Bradford.

Joshua Pyrah and Co. (Finance) Ltd. Private. Reg. Jan. 10. Capital £10,000 in £1 shares. J. R. Armitage and Mrs. E. P. Armitage. Registered Office: Anchor Mills, Batley, Yorks.

J. R. Armitage and Co. (Investment) Ltd. Private. Reg. Jan. 10. Capital £10,000 in £1 shares. The directors are: J. R. Armitage and Mrs. E. P. Armitage. Registered Office: Cravendale Sheds, Ravensthorpe, near Dewsbury.

Merkanto Ltd. Private. Reg. Jan 13. Capital £1,000 in £1 shares. Wholesale and retail textile merchants. J. B. C. Beirholm, and I. Michael. Registered Office: Market Street, Leigh, Lancs.

Chase Textiles Ltd. Private. Reg. Jan. 14. Capital £1,500 in £1 shares. Manufacturers of worsteds, tweeds, etc. L. A. Wells, F. C. Wells. Registered Office: 2 Sunbeam Road, N.W.10.

John W. Comery and Sons Ltd. Private. Reg. Jan. 29. Capital £4,000 in £1 shares. Lace and embroidery manufacturers, merchants, etc. Solicitors: Bryan and Armstrong, 66A Westgate, Mansfield.

Field Mill Ltd. Private. Reg. Feb. 4. Capital £100 in £1 shares. Spinners and weavers of cotton, wool, etc. F. Ashworth, A. F. Ashworth, and D. W. Cowpe. Office: Field Mill, Harrison Street, Ramsbottom, Lancs.

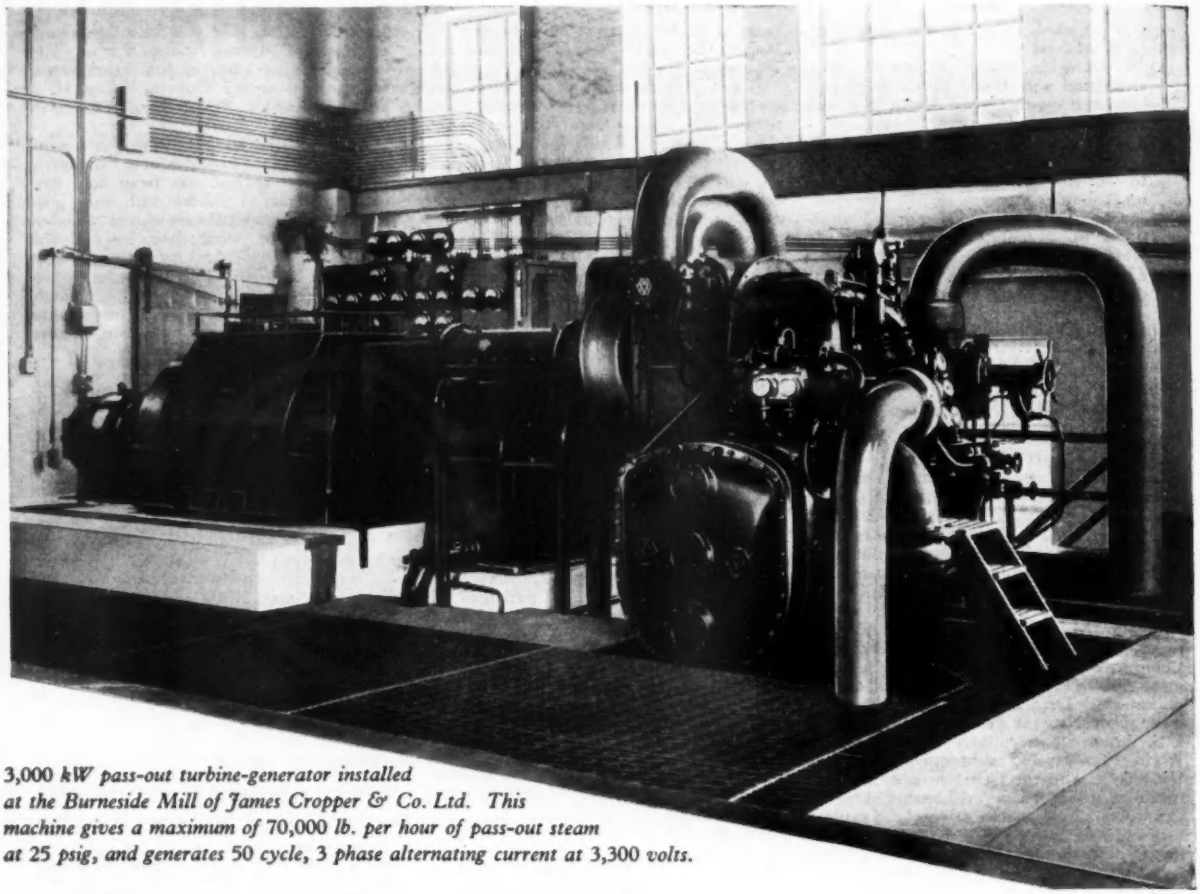
Grignard and Co. (Bradford) Ltd. Private. Reg. Feb. 4. Capital £10,000 in £1 shares. Wool merchants and top makers, etc. F. B. Cross and E. M. Murray. Solicitor: W. B. D. Shackleton, 10 Piccadilly, Bradford.

James Barlow and Sons Ltd. Private. Reg. Feb. 4. Capital £100 in £1 shares. Spinners, and weavers of cotton, wool, etc. F. Ashworth, J. A. Ashworth, and J. Whittam. Registered Office: Sunnybank Mill, Helmshore.

Harlwood Fabrics Ltd. Private. Reg. Feb. 10. Capital £1,000 in £1 shares. Manufacturers and dealers in cotton, rayon, silk, etc., cloths. Registered Office: 4 Chepstow Street, Manchester.

Vine Fabric Printers Ltd. Private. Reg. Feb. 13. Capital £10,000 in £1 shares. Textile manufacturers. Registered Office: Vale Mill, Haslingden, Lancs.

Parland Ltd. Private. Reg. Feb. 14. Capital £2,000 in £1 shares. Manufacturers and dealers in wool, worsted, etc., cloths. Solicitor: Geoffrey E. M. Butler, 37 Brown Street, Manchester 2.



3,000 kW pass-out turbine-generator installed at the Burneside Mill of James Cropper & Co. Ltd. This machine gives a maximum of 70,000 lb. per hour of pass-out steam at 25 psig, and generates 50 cycle, 3 phase alternating current at 3,300 volts.

Steam is costly

-make it work

In many industries where steam is used for processes or heating it is economical to install Metropolitan-Vickers pass-out turbine-generators and so generate electrical power and cut fuel costs.

Metropolitan-Vickers has had considerable experience in the design of self-contained pass-out and condensing steam turbines, and will be pleased to advise on their application in your particular industry.

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RECENT TEXTILE PATENTS

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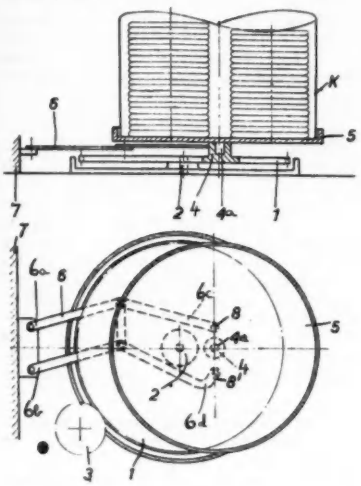
767,070 Coiling Sliver into Cans

O. STEINWANDT, *Waldshut-Baden, Germany.*

A device of simple construction which will not cause any undue wear to sliver cans and which enables sliver to be coiled into a can without imparting a twist to the sliver. A disc 1 mounted on a central pivot 2 is rotated by a wheel 3 engaging the periphery. An eccentric pivot bearing 4 projects up from the disc and has a pin 4*a* provided on a plate 5, the periphery of which is formed with an upstanding flange. A sliver can K may be placed on the plate, being a tight fit within the flange. When

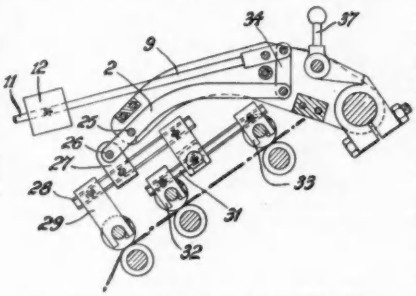


the disc is rotated, the vertical axis of the can, which passes through the pin 4*a* moves in a circle around the pivot 2. To prevent rotation of the can about its own axis independently of the disc, a parallel-link guiding mechanism, 6, is provided. The links of this mechanism are connected to one end 6*a*, 6*b* to a stationary frame 7 of the machine, while the opposite ends 6*c*, 6*d* are connected by pivot pins 8, 8*l* to the plate 5.

767,375 Roller Weighting System

VEB SPINNEREIMASCHINENBAU KARL-MARX-STADT, 27 *Altchemnitzerstrasse, Karl-Marx-Stadt, Germany.*

Drawing heads for spinning machines with variable loading on the top rollers. The link supporting the drawing head is constituted by an arm 9 and a two-armed lever 2 pivoted to the arm at 25. One arm of lever 2 has near its free end a carrier 27 carrying the top rollers, articulated to this arm at 26. A rod 28 is in a bore of the carrier and carries at its front end a saddle 29 for the top front roller. The opposite end of rod 28 carries a bearing through which passes a second rod 31 which carries saddles 32, 33 for the other top rollers. By rocking arm 9 the top rollers are lifted from the frame. By means of a locking device 37 the arm is secured both in the raised and the operative position and to



the arm a weighted lever 11 is pivoted at 10. The lever 11 is connected to lever 2 by a link 34 which is articulated to the respective free ends of levers 11 and 2, and a weight 12 is slidably mounted on lever 11.

767,737 Improved Heald Frames

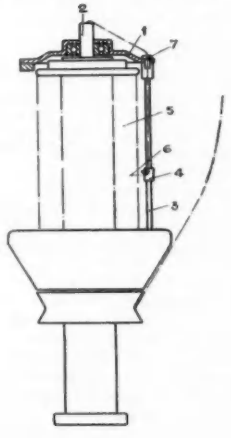
T. LUND AND SON LTD., *Argyll Mills, Bingley.*

A heald frame has the ends of the side members, or the corner members, provided with slots to receive the ends of the slider bars which have recesses near their ends. Locking devices are housed within the ends of the side or the corner members and arranged to be engaged with or disengaged from the recesses in the slider bar ends by actuation of the locking devices from the extremities of the side or corner members.

767,868 Unwinding Device for Double Twist Spindles

VEB SPINN-UND ZWIRNEREIMASCHINENBAU KARL-MARX-STADT, 8 *Lärchenstrasse, Karl-Marx-Stadt* 31, *Germany.*

Describes a thread unwinding device for double twist spindles. The ring 1 is



mounted on the stationary spindle 2 and forms a support for the guide bar 3, which carries a thread guide 4 which is slidable along the guide bar. The thread 6 is led through the guide 4 and a guide eye 7 into the interior of the spindle. By means of the vertical sliding movements of the thread guide on bar 3, the guide adjusts itself automatically to that unwinding of the thread from the bobbin 5 is effected almost at a right angle. As the bar 3, with its thread guide rotates around the bobbin 5, an easy, trouble-free passage of the thread is ensured.

767,974 Weft Stop Motion

J. V. STOBBS, 202 *Pine Street, Nelson.*

A loom has a trap-bar and a trap-box mounted upon the sley, the bar being pivoted to the centre weft fork operating mechanism and furnished with a slot and with a knock-off stud. The box is provided with a screw and resilient means, whereby the bar may reciprocate in the box with the slot out of or in engagement with the screw and resilient means, in such a manner that when the weft fork falls on failure of weft the knock-off stud automatically engages the knock-off mechanism to stop the loom. The trap bar is then raised to a position clear of the knocking-off mechanism, the brake removed, and the loom then turned over until weft is replenished, when the trap-bar automatically becomes reset.

768,376 Sectionalised Ring Frames

FAIRBAIRN LAWSON COMBE BARBOUR LTD., *Wellington Foundry, Leeds.*

A double sided ring frame section comprises fixed longitudinal members including a top beam, two frames each one located at some distance inwards from the ends of the longitudinal members and fastened rigidly to them. Movable longitudinal rails on each side of the frame are connected by transverse members, and a pair of driving shafts for the movable rails extend the full length of the section and are independently driven. Means are provided for rigidly connecting adjacent sections so that the ends of the fixed longitudinal members occupy aligned positions.

768,472 Testing Warp, etc., Size

GEBRUDER SUCKER G.m.b.H., *Blumenbergerstrasse* 143-145, M. GLADBACH, *Rheinland, Germany.*

A method of testing a sizing liquid which comprises determining the adhesive properties of the liquid by wetting two surfaces of a testing block with the liquid, pressing the two surfaces together and measuring the force required to pull the two surfaces apart. The viscosity of the liquid is determined either simultaneously or alternately with the determination of its adhesive properties, and the values thus obtained are compared.

768,576 Automatic Loom Magazines

R. HRDINA, 245 *Knightsbridge, London, S.W.7.*

A magazine of the semi-circular type for automatic looms in which the device for bringing the pirns successively into position under the hammer comprises a weight carried on one end of an arm. The other end of the arm is in driving engagement with the spindle of the magazine, on which the thread holder is fixed. The combined length of the arm and weight is equal to the radius of the semi-cylindrical magazine, so that the weight can bear on the top pirn in the magazine, thereby intermittently turning the thread holder as the pirns are discharged from the magazine.

768,661 Weft Replenishing Motion

W. GLEDHILL AND SONS LTD., *Bridge Mills, Holmfirth, Huddersfield.*

A weft replenishing mechanism for a loom, in which there is a pirn battery having compartments. A rocker arm adapted to co-operate in turn with each of a series of selectors connected one to each compartment, is provided with endwise movement to bring it into a fresh operative position after each weft change. A cam is adapted to be given a step by step rotation, and a connecting rod attached to the rocker arm is connected to the cam on a member fixed to the cam. The axis of this connection is eccentric with the axis of rotation of the cam. Means are provided for arresting the cam in a series of positions each corresponding with an operative position of the rocker arm.

768,674 Weaving Pick and Pick Cloths

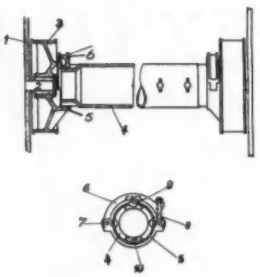
LANEX SOCIETE ANONYME, 14 *rue Aldringer, Luxemburg.*

Method of weaving pick and pick fabric on a pick at will loom having an automatic weft replenishing mechanism and operating with two or more shuttles. The shuttles are caused to follow a sequence of picking operations during which each shuttle on completion of selected picks is subjected to a feeling operation. On certain other selected picking operations no shuttle is picked, in order to enable the weft supply of the "felt" shuttle to be replenished or to enable a shuttle replenished on the previous pick to be brought to shed level so that it can be the next shuttle to be picked.

768,807 Improved Warp Beam

VYZKUMNY USTAV TVARECICH STROJU A TECHNOLOGIE TVARENI, 14 *Smeralova, Brno, Czechoslovakia.*

Describes an improved construction of warp beam. At each side wall 1 of the loom, a brake drum 3 of a band brake is mounted on a pin 2. Each drum has a cylindrical extension to form a bearing for the beam 4. The extension is divided into a lower half 5 connected to the brake drum, and an upper half forming a yoke 6, one end of which is mounted about a pivot 7 on the drum, whilst the other end is connected by a bolt 8 with the fixed half 5. The yoke 6 has a tooth 9 to engage one of several corresponding recesses 10 in the surface of the reduced end of the beam, when the yoke is in its closed position. When a beam is to be inserted, it is placed with its ends on the lower half of the extension 5, while the yoke 6 is in its upper position. The yoke is then moved so as to rest on the beam, which is rotated until

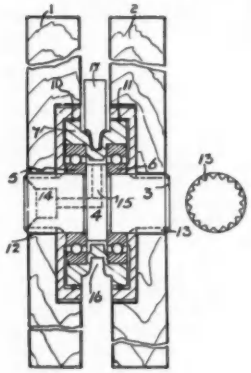


the tooth 9 engages recess 10 in the end of the beam. The yoke is fastened to the fixed half 5 by the bolt 8.

768,954 Roller Assembly

FAIRBAIRN LAWSON COMBE BARBOUR LTD., *Wellington Foundry, Leeds* 1.

A roller assembly of the type employed in spinning, roving or drawing frames. The assembly comprises a spindle 3 having a central portion of enlarged diameter 4. Two ball bearings 5, 6, are mounted on the spindle, their inner races being fixed to the spindle while their outer races are fixed to a bearing 7. Sealing rings 10, 11 are provided. After assembly of the bearing members, the rollers 1, 2 are pressed in position on the serrations 12, 13. The spindle is drilled at 14 and 15, the two drillings forming a



continuous hole, such that when grease is applied to the end of channel 14, it is forced through into the space between the two ball bearings and into the bearings themselves. To produce effective drafting it is necessary to load the upper rollers and This is done by a V groove 16 formed in the bearing, and the arm 17. This arm is loaded and the pressure is conveyed to the roller faces via the member 7, the ball races 5 and 6 and the spindle 3. Whilst the arm 17 allows a limited amount of rocking motion of the spindle 3, the construction also ensures that the pressure of the arm is applied equally to both rollers.

769,055 Static Eliminator

INSTITUT TEXTILE DE FRANCE, 59 *rue de la Faisanderie, Paris* 16, *France.*

Apparatus to eliminate static electricity in fibres and fabrics liable to have been charged. A stream of gas previously exposed to a radio-active substance is projected on to the material. It has been found that a jet of gas conditioned in this manner will cause complete and practically instantaneous disappearance of the electric charges on the material.

769,056 Comb Support Bars in Drawing Frames

CAV. ENRICO SCARANI AND FIGLI S.P.A., *Via Augusto Murri* 148, *Bologna, Italy.*

Apparatus for turning the comb support bars in drawing frames, comprises a disc which is loosely mounted on a shaft and provided with notches and guide vanes, by which the comb support bars are engaged and turned without shock during the change in their direction of movement, so that the needles are brought into a position in which they may be readily cleaned.

769,098 Jacquard Machine Stop Motion

JOHN JARDINE LTD., *Chelsea Street, Nottingham.*

Describes a stop motion for a jacquard machine employing cards having two holes in each card. A plunger engages each hole and means actuated by either of said plungers is provided for stopping the machine if a plunger fails correctly to enter a hole. In this event the plunger will strike part of the card which will depress the plunger and actuate a switch to stop the machine.

769,112 Centre Weft-Fork Motion

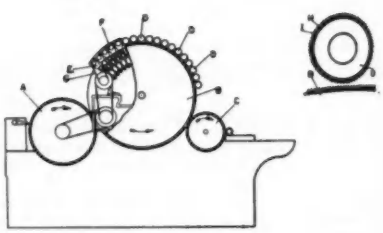
N. HARGREAVES, 50 *Fourlands Road, Idle, Bradford.*

A centre weft-fork motion for a loom has a tippler and weft-fork prongs, the tippler being operated by a cam slide, which is adapted to be moved in one direction by means of a motion rod, against the action of a resilient member. The connection between the cam slide and the motion rod is positive only in the direction of movement of the cam slide against the action of the resilient member.

769,264 Cotton, Viscose, etc. Card

C. CARMINATI, *Corso di Porta Nuova, 3a Milan, Italy.*

A machine for carding cotton, viscose staple and similar fibres. C is the licker-in cylinder, B the large cylinder, and A the doffer. Upon the large cylinder are arranged clearing cylinders D, consisting of shafts supported by supports E and



bearing at one of their ends sprocket pinions F for receiving from a chain G a slow motion for the purpose of bringing continuously the whole surface of the cylinders D to face the cylinder B, so that the wear is uniformly distributed all round the cylinders D. The clothing of the cylinders is made of a metal tape H provided with points I.

769,290 Stripping Bobbins

GEORGE FISCHER AKT. GES., *Schaffhausen, Switzerland.*

Apparatus for removing yarn remnants from bobbins, comprises stripping tools arranged around, and spaced from a location for the axis of a bobbin. Each tool is displaceable in a direction radial to the axis, and is mounted so as to be pivotable in a plane containing the axis. Means operable by a first cam disc remove the tools from engagement with the bobbin and at least one secondary cam disc operates means for continually holding the tools in a position of engagement corresponding to the shape of the bobbin by pivoting the tools when they are operating.

769,556 Warp Yarn Control

J. W. SCAYSBROOK, 72 *Oakley Road, Shepshed, Leicestershire.*

A method of controlling ends of a beam, which comprises applying to the ends on completion of beaming a reed-like device comprising guides to separate the ends at a required spacing. The spacing device is retained in engagement with the ends on the beam and the device is then utilised to space the ends for insertion at one and the same operation, each between appropriate guides in the next machine.

769,602 Top Roller Weighting

VEB SPINNEREIMASCHINENBAU KARL-MARX-STADT, 27, *Altchemnitzer Strasse, Karl-Marx-Stadt, Germany.*

A drawing head has a supporting arm for the saddle carrying the top rollers and is articulated to the arm which is rockable and loaded by a weight lever with a sliding weight. The weight lever is mounted independently of and above the saddle supporting arm and is carried by a link mounted on the shaft carrying the supporting arm, and during use presses on the supporting arm between the shaft and the point of articulation of the saddle.

769,729 Warp Stop Motion

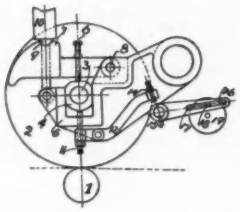
VERBRUGGE FRERES, 14 *Boulevard Jules Lagae, Roulers, Belgium.*

A warp stop-motion device in which a small plate supported by the healds has two slots, one of which is of elongated shape and constant width, and is designed to receive the fixed rod of the heald frame guiding the motion of the heald. The other slot has a narrow complex shape in its upper part, and is wider at its lower part, so as to allow the rotating rod to rotate in the wider part of the slot, and to lock the rod against rotation when it passes into the narrow part.

769,793 Automatic Electric Stop Motion

FAIRBAIRN LAWSON COMBE BARBOUR LTD., *Wellington Foundry, Leeds.*

Describes an improved automatic electric stop motion. Sliver passes between rollers 1 and 2, the latter being provided with a shaft 3 carried in bearing 4 which slides in a support 5. Pressure is applied to the bearing through a screw 6 from an arm 7 by spring pressure applied at point 9 from the spring container 10. A screw 11 carried by a contact-bearing lever 12 rests lightly against the surface of bearing 4. The arm bears a contact-making screw 14, the screw being adjusted to be not quite touching, a contact bar 15. This bar is carried at each end in insulating bearings, and also carries a link 16. The link has a slot 17 embracing pin 18, carried eccentrically on the face of a flat wheel 19 which is slowly rotated. If a lap occurs so that the sliver builds up round one of the rollers,



the bearing 4 is pushed away from roller 1, so that lever 12 is permitted to rotate a short distance in a clockwise direction. This brings the point of screw 14 into contact with the surface of the shaft 15. Contact is established and the drawing frame is stopped.

770,018 Producing Curled Yarn

ALGEMENE KUNSTZIJDE UNIE N. V., 76, *Velperweg, Arnhem, Holland.*

In BP No. 767835 an apparatus is described for the production of curled yarn from continuous filament yarn. The apparatus comprises a tube, means for blowing a gas stream through this tube, with means for feeding a yarn through the tube. An obstacle in alignment with the tube deflects yarn emerging from it, and a collecting device operates at a take-up rate less than the rate of feeding. An improvement consists in that the tube is defined in a body having a notch at the entrance of the tube, an adjustable thread guide is provided above the notch and a stationary guide is secured to the body near the exit end of the tube. A freely rotatable guide pulley is mounted on an axle on which also a smaller guide pulley is mounted, both pulleys being inter-connected. The axle with the two pulleys is arranged on the same side of the body as the stationary thread guide.

770,084 Opening and Cleaning Machine

WHITIN MACHINE WORKS, *Whitinsville, Massachusetts, U.S.A.*

An opening and cleaning machine comprises a first beater and a second beater mounted parallel to it, both being rotated in the same direction. Material is fed to the first cylinder, and a deflector is mounted between the first and second beaters and in the path of travel of the fibre toward the point of closest approach of the two beaters. Means are provided to determine the angular position of the deflector, which acts to control the path of travel of the fibre as it is moved towards the point of closest approach of the beaters.

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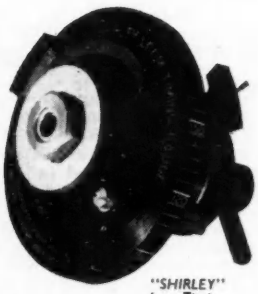

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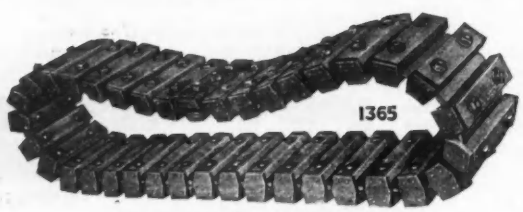

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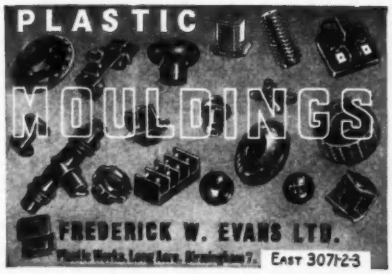

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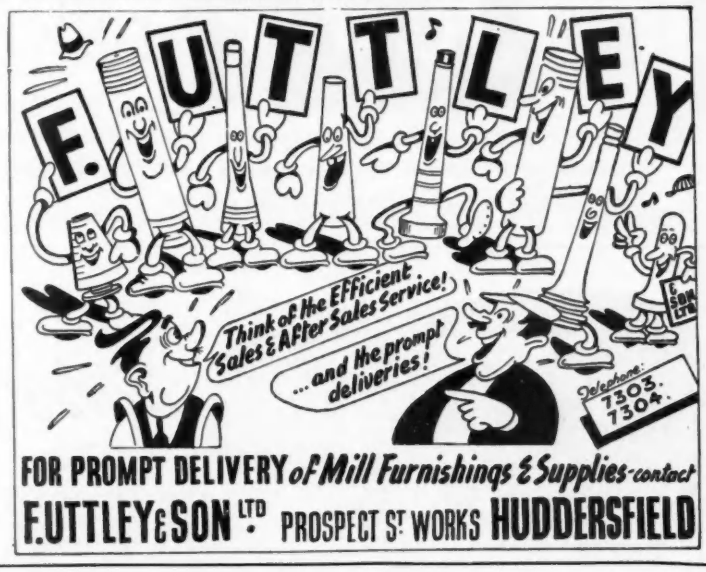
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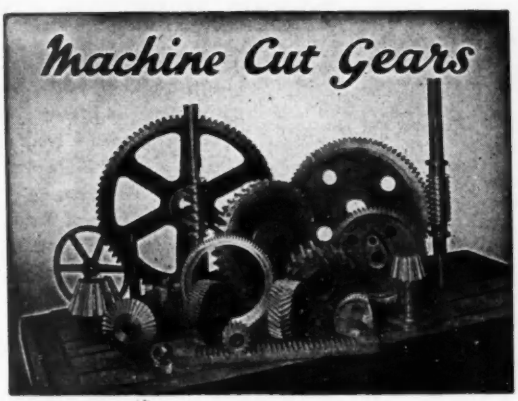

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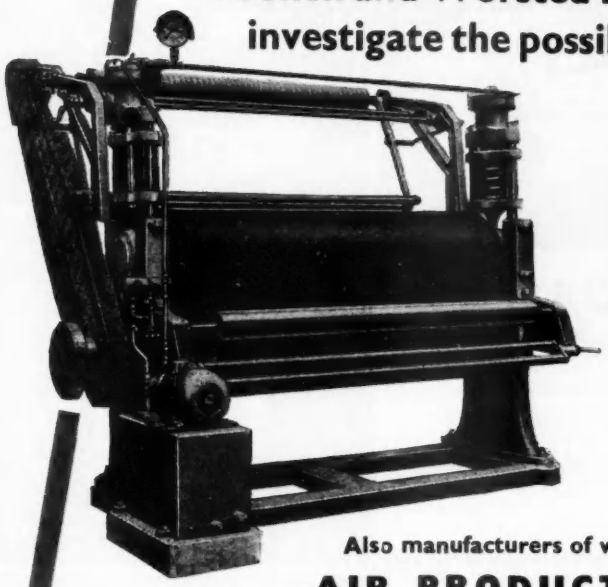

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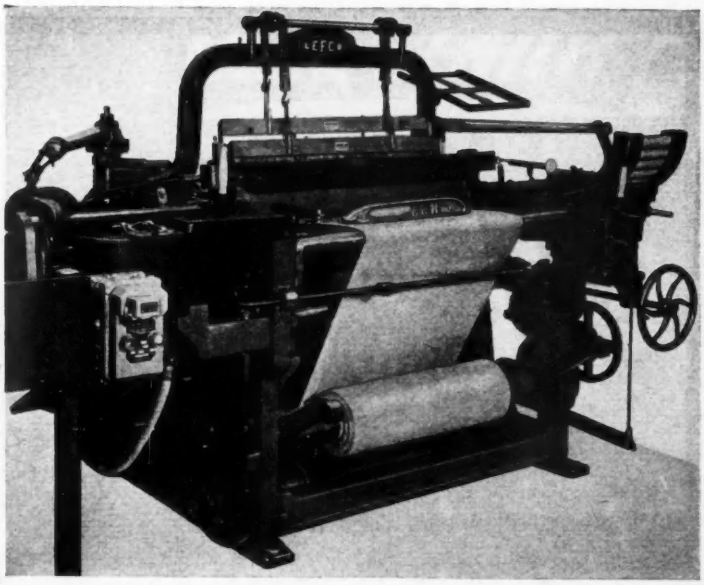

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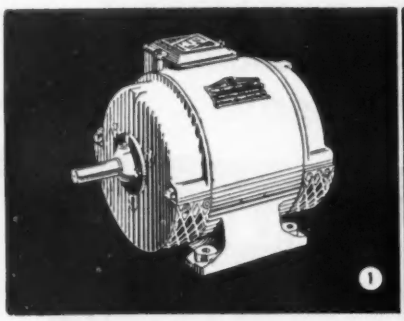
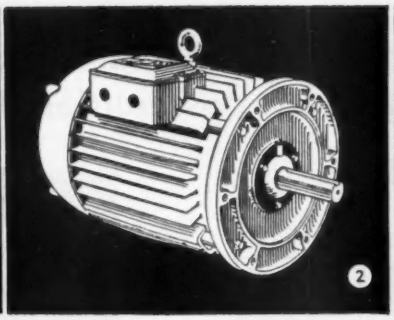
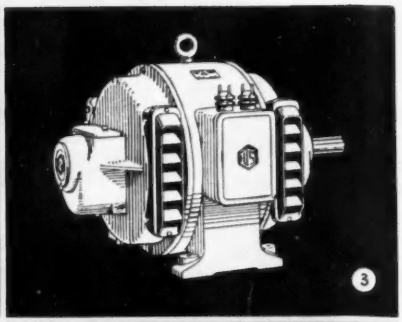

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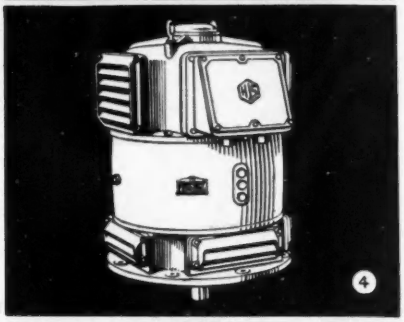

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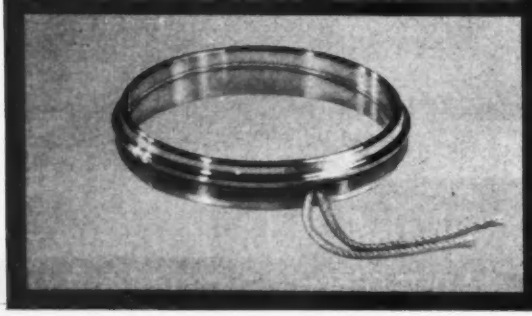

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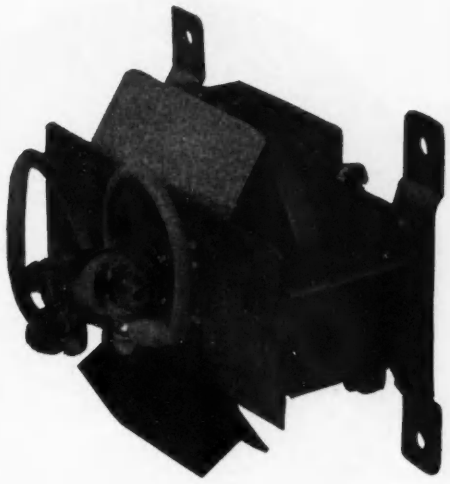

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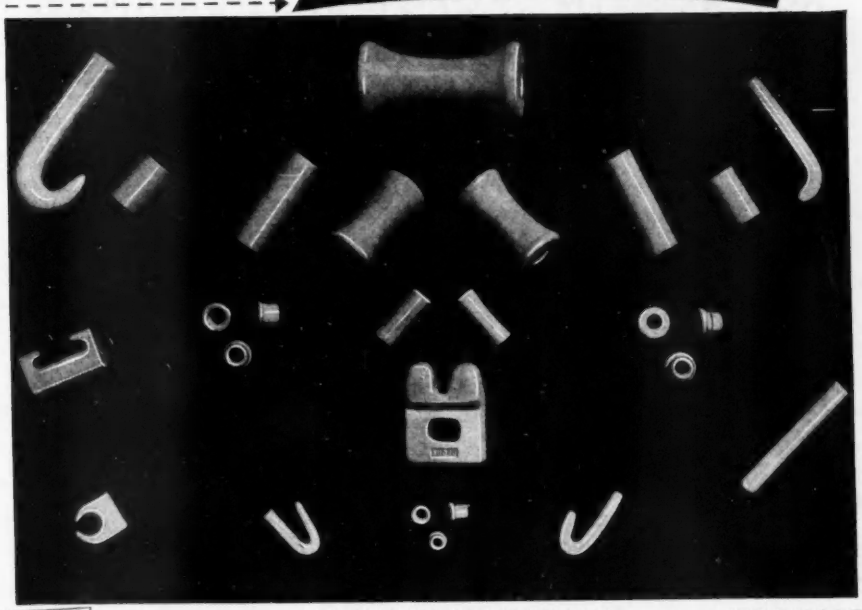

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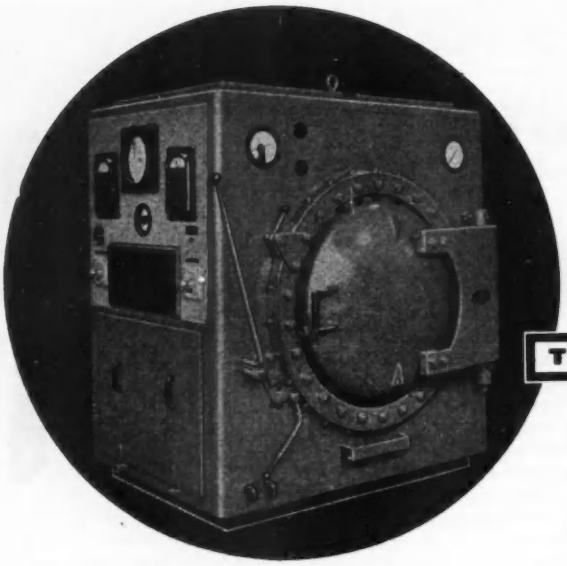

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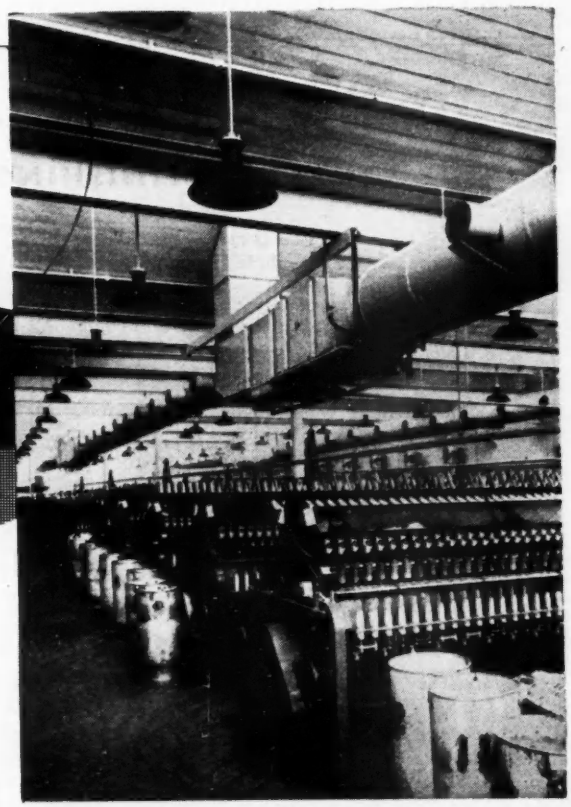

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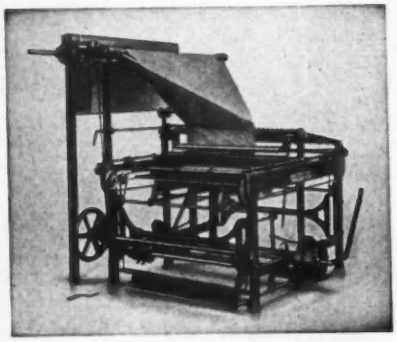

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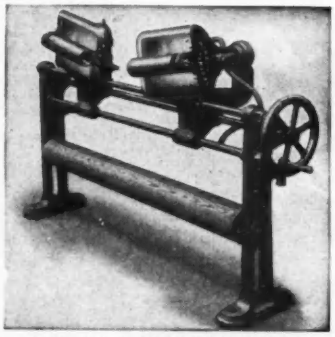

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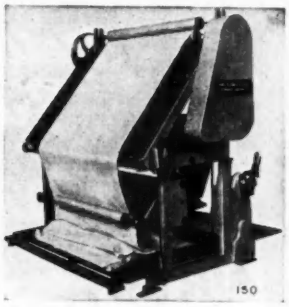

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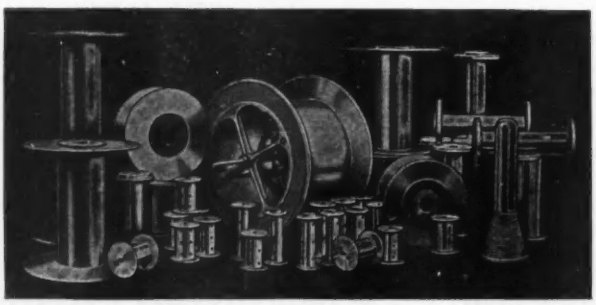

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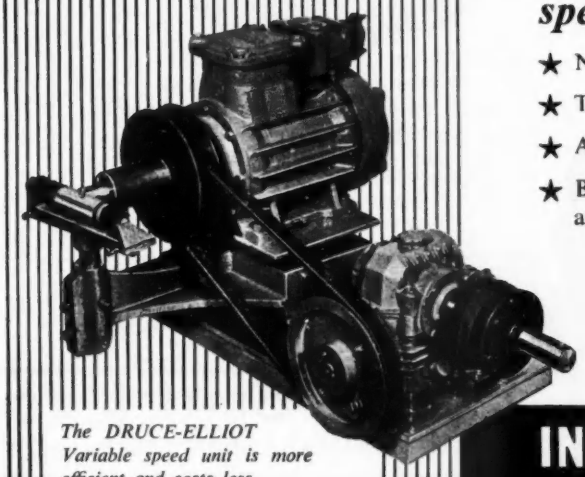

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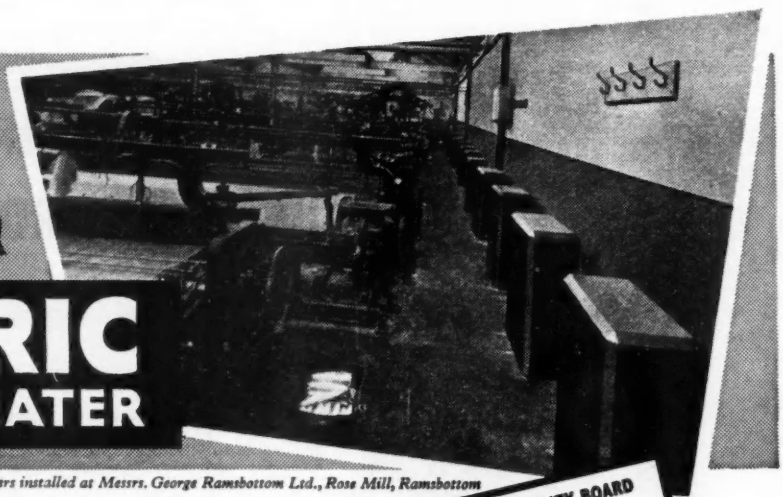

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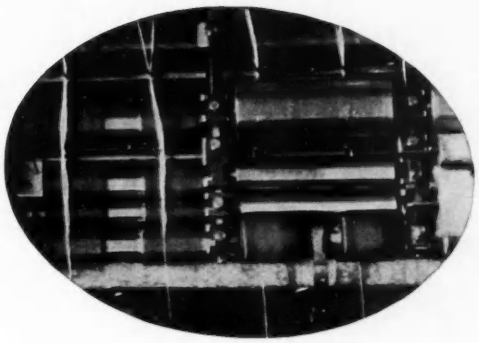

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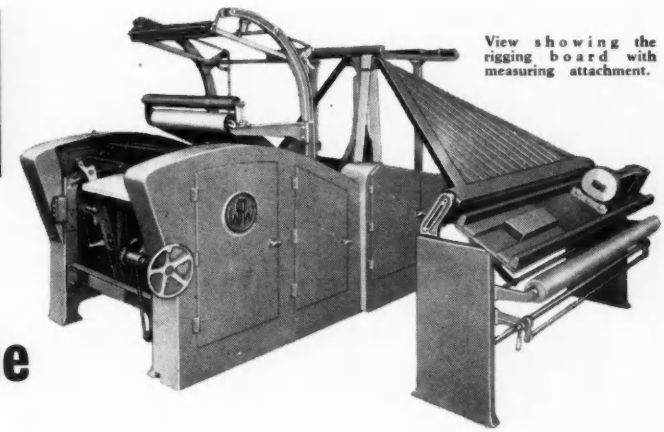

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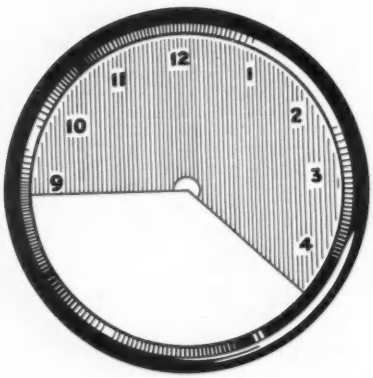

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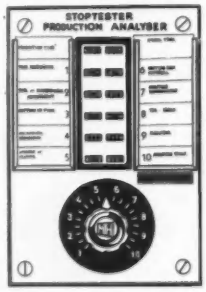

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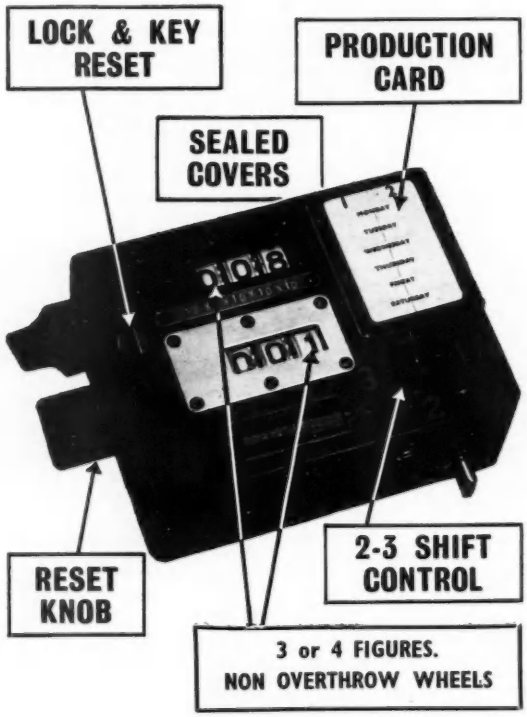

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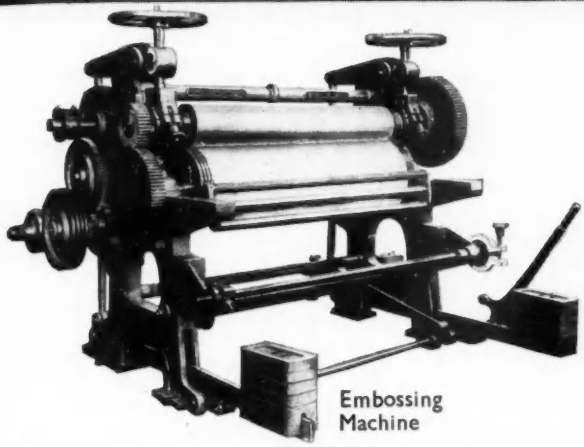

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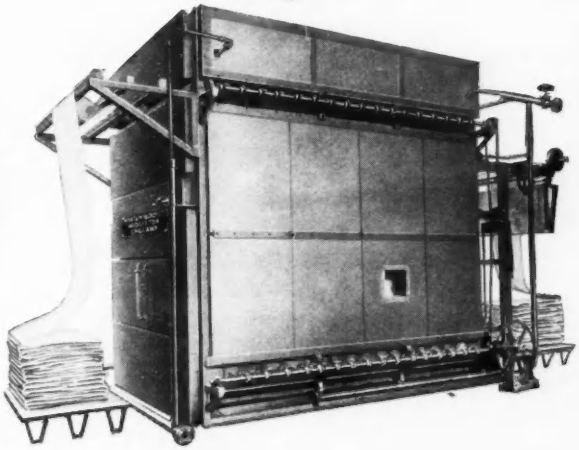

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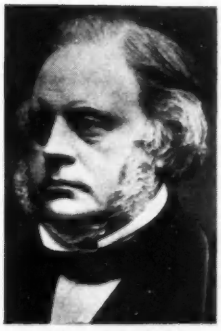

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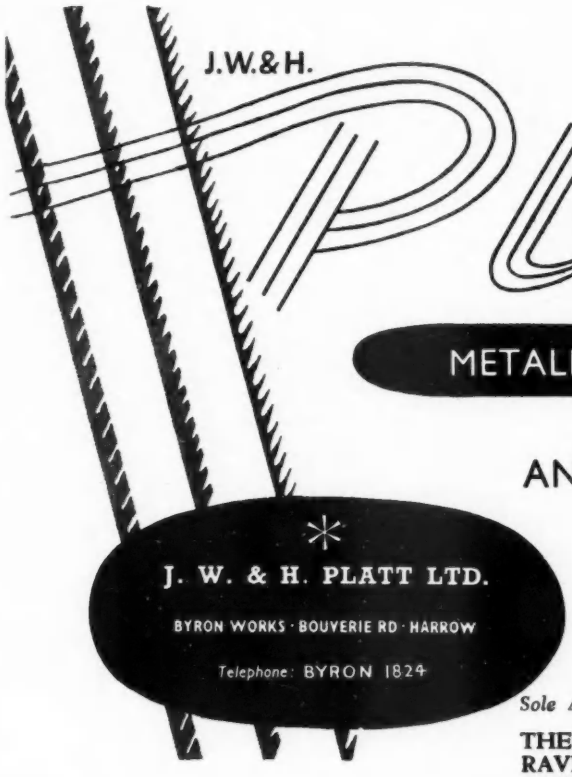

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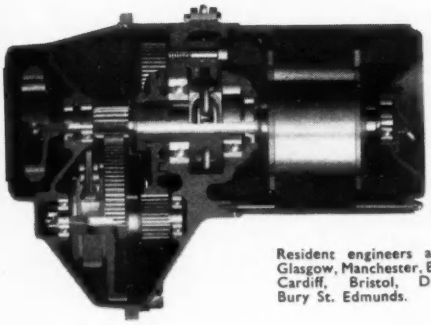

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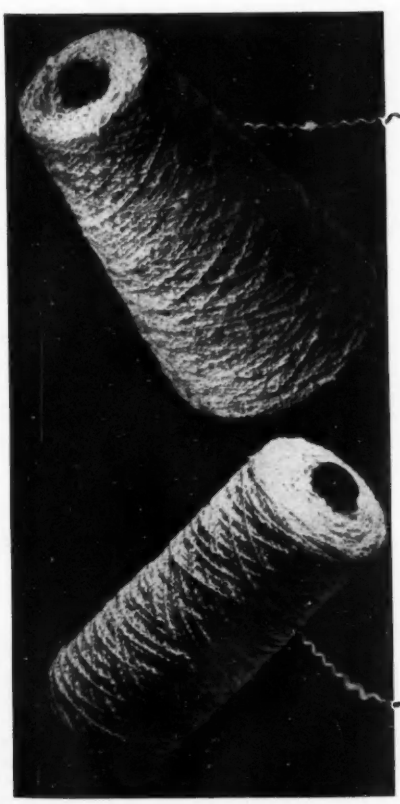

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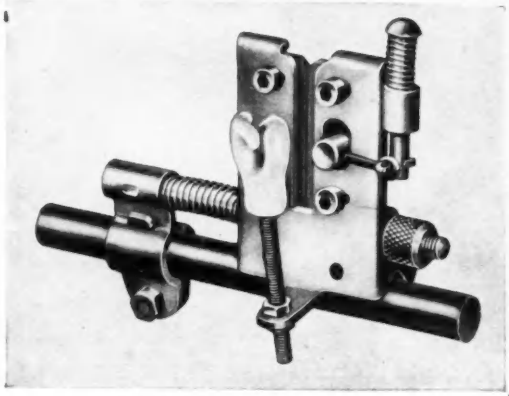

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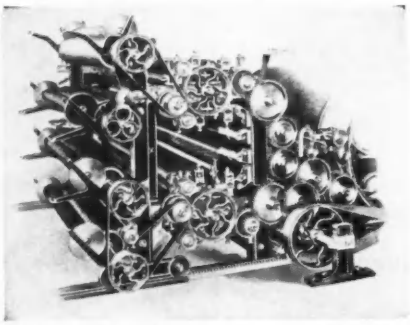

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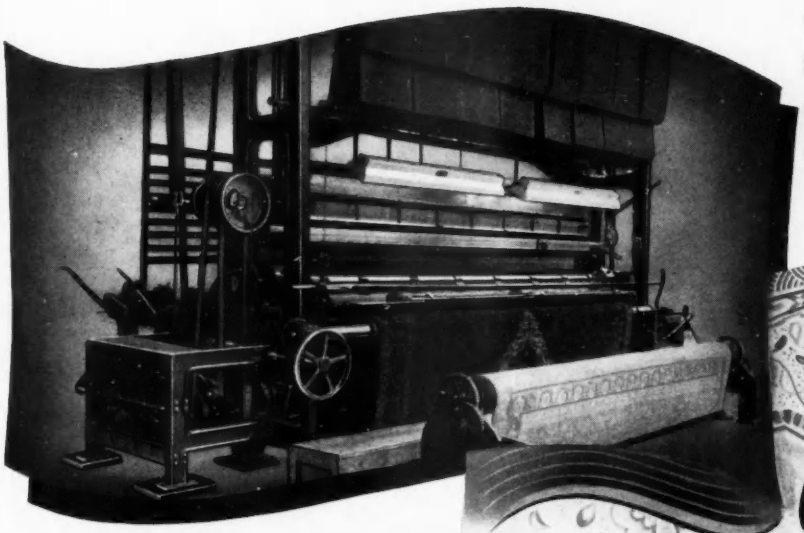

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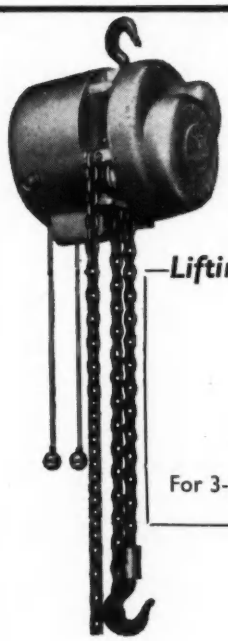

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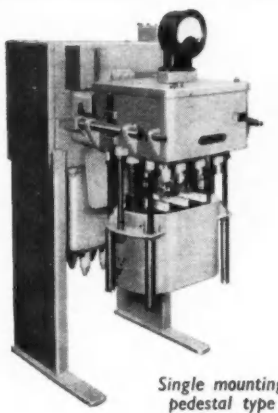

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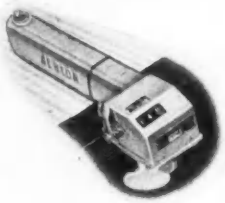

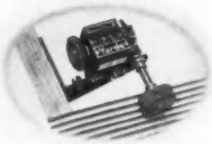

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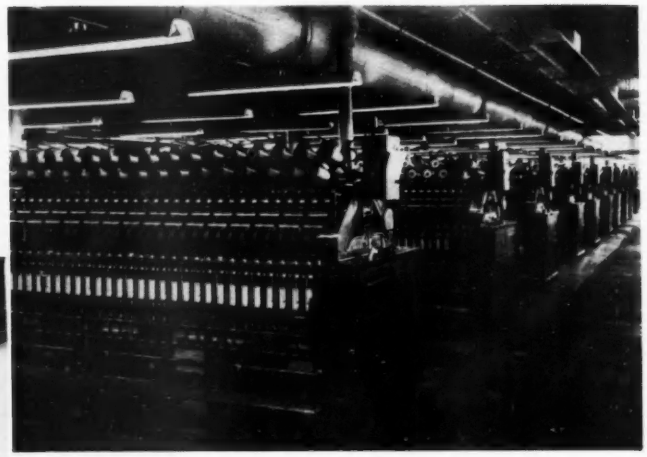

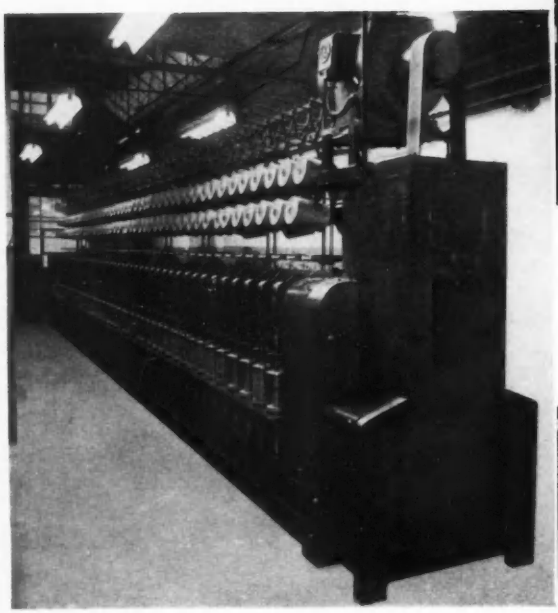

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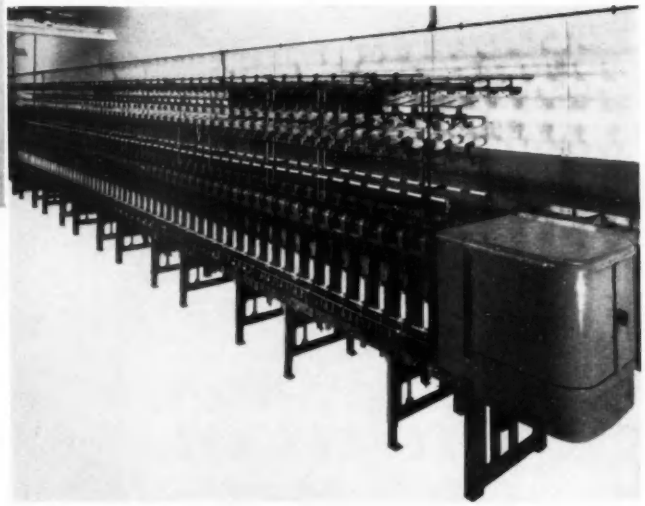

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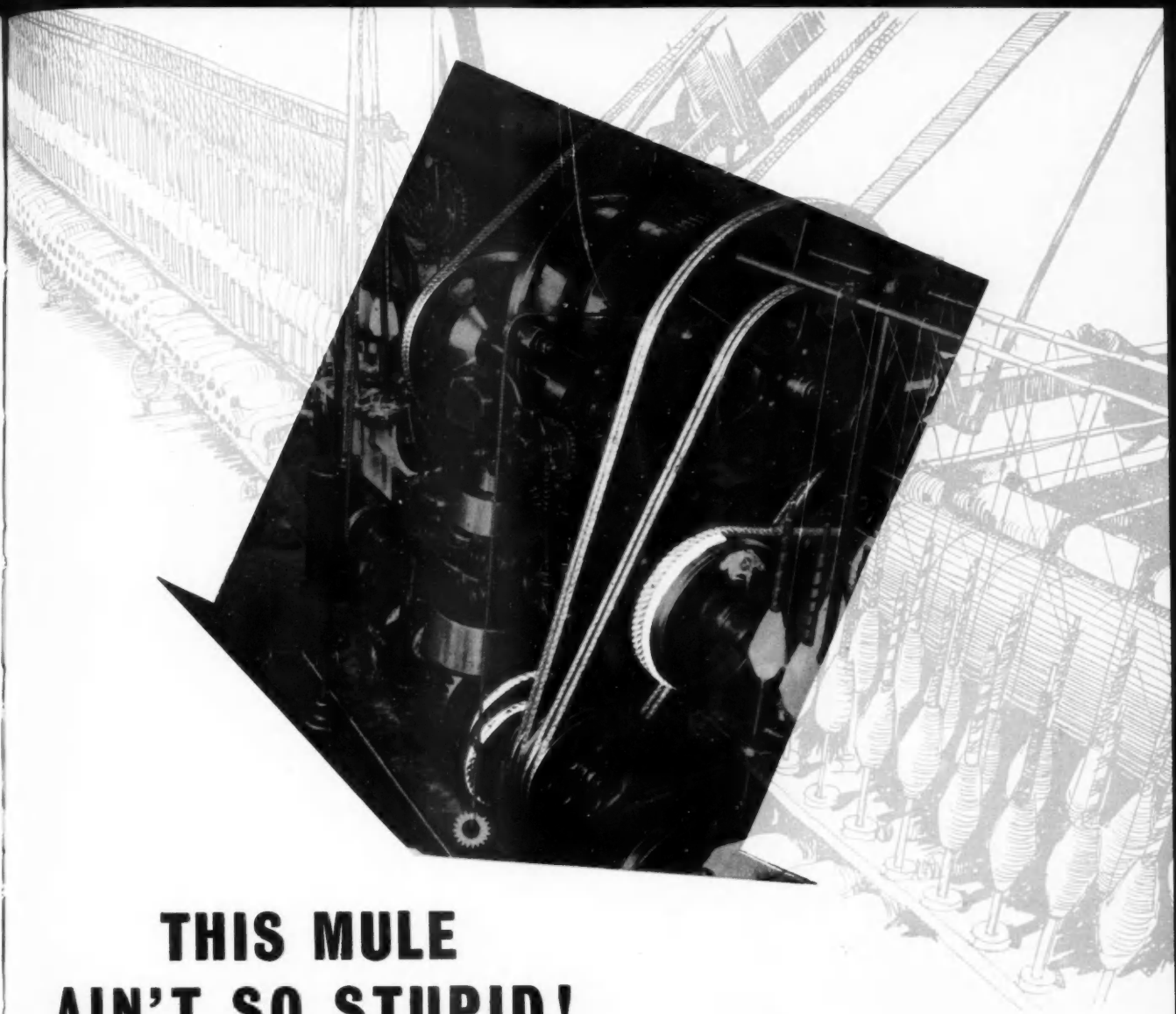

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